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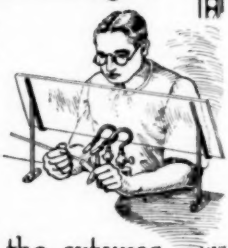

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on Vitamins and the Borderland Between Health and Disease. By W. CRAMER, D.Sc., Ph.D., M.R.C.S.—(*Illustrated*) 633

AN ADDRESS on Cytoclesis: A Phenomenon Explaining the Course of Embryonal Development. By Prof. F. WOOD JONES, D.Sc., M.R.C.S.. 684

ORIGINAL ARTICLES.

A Communication Between the Vagus and the Cervical Sympathetic, with its Clinical Aspects. By R. C. SHAWE, M.R.C.S.—(*Illustrated*) . 640

The Mental Conditions Found in Certain Sexual Offenders. By M. HAMBLIN SMITH, M.D... 643

Notes on an Outbreak of Epidemic Encephalitis with Painful Abdominal Spasm. By Prof. ARTHUR J. HALL, M.D., F.R.C.P. 646

The Speech Clinic. By Prof. E. W. SCRIPTURE, M.R.C.S., M.D..... 647

CLINICAL AND LABORATORY NOTES.

Uncommon Conditions Associated with Liver Lesions. By F. J. O'DONNELL, M.R.C.P... 648

A Case of Intraperitoneal Ovarian Pregnancy with a Full-term Child. By S. SUVANSA, M.R.C.S... 648

MEDICAL SOCIETIES.

Royal Society of Medicine: Section of Electro-Therapeutics: Clinical Results of Deep X Ray Therapy 649

Medico-Legal Society: Sudden Death by Inhibition 652

Aberdeen Medico-Chirurgical Society 653

REVIEWS AND NOTICES OF BOOKS.

Diagnosis and Treatment of Acute Abdominal Diseases. By Joseph Adams, M.B., F.R.C.S.. 653

Diseases of Women. By Prof. Harry Sturgeon Crossen, M.D., F.A.C.S. 554

Dysentery in the Federated Malay States. By W. Fletcher, M.D., and Margaret W. Jepps 554

X Rays. By W. E. Schall, B.Sc..... 554

Urologisches Praktikum. By Prof. I. Cohn..... 554

Quantitative Chemical Analysis. By Prof. Frank Clowes, D.Sc., and J. B. Coleman, A.R.C.Sc. 655

British Journal of Children's Diseases 655

NEW INVENTIONS.

An Improved Abdominal Support (George K. Grimmer, M.D., F.R.C.S.)—(*Illustrated*) 655

THE CONDUCT OF MEDICAL PRACTICE.

XIII.—Legal Aspects of "Dichotomy." 656

LEADING ARTICLES.

MEDICAL EDUCATION IN CAIRO 657

CLINICAL RESULTS IN DEEP X RAY THERAPY..... 658

THE OPERATIVE TREATMENT OF CANCER OF THE LARYNX 659

THE AVAILABILITY OF PHYSIOLOGICAL KNOWLEDGE..... 659

ANNOTATIONS.

Jonnesco's Operation for Angina Pectoris 660

Improvements in Optical Equipment of Oto-Laryngologists 660

Autopsies and Death Certification 660

The Hospital Work of the Salvation Army 661

Electrocution of Mosquito Larvæ..... 661

Theories of Placental Circulation..... 661

A New Alcohol Method for Preparing Insulin .. 662

The Health of the Indian Child..... 662

The Influence of the Factory Surgeon in Industrial Welfare 662

The Composition of Bayer "205" 663

A New Treatment for Hyperemesis Gravidarum 663

Plants and Men..... 664

The L.C.C. School Medical Staff 664

Noblesse Oblige 664

THE SERVICES.

Royal Army Medical Corps.—Royal Air Force.—I.M.S. 665

MODERN TECHNIQUE IN TREATMENT.

LXIV.—The Treatment of Cervical Adenitis. By WALTER G. HOWARTH, M.B., F.R.C.S. 664

SPECIAL ARTICLES.

Drug Incompatibility. By PERCY MAY, D.Sc. .. 666

University of Oxford: Extension of Science Departments. — (*Illustrated*) 671

Report of the Association of Certifying Factory Surgeons (1922–23) 668

Ireland: Death of Sir Walter Buchanan..... 670

Berlin: The Battle of the Clubs..... 671

CORRESPONDENCE.

Physiology and the Practitioner (Dr. Thomas Lumsden) 672

Certificates of Insanity (Dr. E. D. Macnamara, Dr. Ian D. Suttie)..... 672

The Familial Occurrence of Addison's (Pernicious) Anæmia (Dr. Arthur F. Hurst, Dr. Gordon Ward) 673

Doctors and Advertising (Dr. H. D. L. Spence).. 674

The Wassermann Reaction in the New-Born (Dr. J. N. Cruickshank) 674

A Critical Examination of Psycho-Analysis (Dr. A. Wohlgemuth) 675

Measles Infection: Reasonable Methods of Prevention. (Dr. H. M. Stewart) 675

Tests for Cure of Gonorrhœa in Women (Dr. J. Johnston Abraham).. 675

Smouldering Clothes 685

Medical Reciprocity in Ukraine (Dr. Alexandra Racovski) 686

MEDICAL NEWS.

University of Oxford: Radcliffe Travelling Fellowship 678

University of Liverpool... 678

University of Durham.... 678

Society of Apothecaries .. 678

British Medical Association: Scholarships and Grants 678

The late Dr. W. B. Betenson 649

Irish Medical Schools and Graduates Association.. 651

Horsham Hospital 670

Princess Alice Hospital, Eastbourne 672

Harnett *v.* Bond and Adam 678

Queen's University (Belfast) Club, London 678

Chartered Society of Massage and Medical Gymnastics 678

National Association for the Prevention of Tuberculosis 678

Fellowship of Medicine and Post-Graduate Medical Association 678

Welfare of the Deaf..... 679

Tunbridge Wells General Hospital 679

The Schick Test at Brighton 679

Naval Medical Compassionate Fund..... 679

The late Dr. R. Fitzmaurice 679

OBITUARY.

Sir William Macewen, F.R.C.S., F.R.F.P.S., F.R.S.—(*With Portrait*). 676

Henry Rundle, F.R.C.S. . 677

Thomas Hill Jamieson, M.D., M.R.C.P..... 677

Herbert Leyland Sackett, M.B., B.S., F.R.C.S. ... 677

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: National Health Insurance Bill..... 679

House of Lords: Dogs as a Subject of Medical Research 680

House of Commons: Medical Boards and Ex-Service Men.—Stone-dusting and Health of Miners.—Lead Poisoning in China and Earthenware Trades.—Navy Estimates.—Lunacy Laws Inquiry.—Tubercle-infected Milk.—Vaccination Act.—The Schick Test 680

NOTES, COMMENTS, AND ABSTRACTS.

Abdominal Control 685

"Ambidex" Nail Brushes 686

Ambulance Camels..... 686

A Bibliography of Eugenics 686

Thought-reading Made Easy 686

The Healing Art Among the Ancients 686

Medical Diary 682

Appointments..... 683

Vacancies..... 683

Births, Marriages, Deaths. 683

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The effects produced by the absence of vitamins are characteristic and specific for each vitamin. In every case the administration of the missing vitamin relieves the specific condition with a certainty and a rapidity which is one of the most striking and unique phenomena in medicine.

VITAMINS IN ORDINARY DIET.

Not infrequently it is said that these facts, although important and interesting from the scientific point of view, have little bearing on practical problems of nutrition, because under the conditions of modern civilised life deficiency diseases are rare. The ordinary mixed diet on which we live is said to contain sufficient vitamins to prevent the onset of these diseases. This view—expressed not only by clinicians who are sceptical about the application of the results of laboratory experiments to man, but even by those who are engaged in the actual study of vitamins—I hold to be mistaken. It is true that there is no difficulty in constructing from the ordinary articles of food a diet which contains an ample supply of vitamins. But the diet of large classes of the population is in fact so poor in vitamins as to impair health, especially in children. This fact is due partly to economic reasons, but mainly to ignorance on the part of the consumer, and on the part of those concerned with the preparation of food on a large scale before it reaches the consumer—especially the milling of flour for bread, the manufacture of margarine, and the tinning of meat and vegetables. Again, a misconception of the mode of action of vitamins has led to under-estimation of the practical importance of these substances in nutrition, even by many ardent supporters of the vitamin theory; and the harmful effects of a restriction in the intake of vitamins, insufficient in itself to produce an obvious and typical deficiency disease, have received little attention. In the numerous investigations on vitamins, animals in full health on an ample supply of vitamins have been compared with animals in which a typical deficiency disease had developed as the result of the complete absence of one or other vitamins. But the borderland between health and disease, the borderland created by a restriction in the intake of vitamins, has remained unexplored.

KERATOMALACIA IN DANISH AND ENGLISH CHILDREN.

Before dealing with this unrecognised aspect of the vitamins, I should like to point out that even in the immediate past deficiency diseases were of more frequent occurrence even in Europe and in this country than is generally recognised. The cause and cure of infantile scurvy or Barlow's disease, now known to be due to a deficiency in the vitamin C, was, of course, known long before the vitamin conception was developed. But the cause and cure of a condition of defectivenutrition in children, which is normally associated with an affection of the eyes, has only recently been understood as being due to a deficiency in the fat-soluble vitamin A. Curiously enough, the European country in which this condition has occurred with exceptional frequency is Denmark, one of the largest producers of butter and dairy produce which are the vehicles of vitamin A; for Denmark exported too much of its vitamin A and substituted for it margarine devoid of this vitamin. The cases described very fully by Bloch[1] occurred in a group of children kept in an institution. Other two groups of children kept in the same home did not develop the disease. The diet of these three groups differed: Group A, which comprised infants and delicate children, had chiefly whole milk and milk puddings. This group did not develop the disease. The older children, Group B, received a more varied diet, which may be given fully for its interest:—

Breakfast: Oatmeal, bread and beer soup, and a little fresh milk.
Mid-day dinner:—First course: Milk puddings, oatmeal, soups (fruit juice or meat broth). Second course: Fish or meat and mashed potatoes.
Afternoon: Cocoa with bread and margarine.
Evening: Milk pudding, bread and margarine.

The margarine was vegetable margarine and all food was prepared with this margarine. The milk used was half-skimmed milk. The children received no butter, cream, or eggs. Group B was divided in two subsections, B1 and B2. In Group B1 the eye disease developed, while the Group B2 remained free. And it was found that the group that remained free had received regularly a small amount of whole milk for breakfast, while the matron who looked after the third group in which the eye affection appeared, had not given whole milk for breakfast. The disease disappeared when cod-liver oil was given. Here, therefore, in spite of a varied and apparently nutritious diet an almost complete deficiency in vitamins was established.

Similar outbreaks of epidemics which were associated with an eye affection have occurred in this country during the last 40 years in various industrial schools and have been recorded in the literature. The last recorded outbreak was in 1911 and was investigated by Dr. J. P. McGowan and Dr. C. McNeil.[2] Clinically, the outstanding feature of these epidemics is described by the authors as a "distorted" pneumonia which may vary in type from a fulminating rapidly fatal type to an abortive or latent group of febriculæ. The authors draw special attention to the fact that there was also very prevalent in this school a chronic granular conjunctivitis. McGowan and McNeil clearly recognised the non-contagious nature of the epidemic, but they were unable to explain the nature of the disease or to recommend a rational treatment. The diet had been carefully drawn up by a high scientific authority. At that time experiments on animals had not yet clearly revealed the existence of vitamins. The discovery of these food factors, the distinction between the vitamin A and B, and the experimental production of an eye affection by withholding vitamin A from the food date from the years immediately following this outbreak. When the next outbreak occurred in the same industrial school in 1919 Dr. Marshall Findlay, who was sent down to investigate the matter, was struck by the resemblance

[1] Journal of Hygiene, 1921, xvii., 283.
[2] Edinburgh Medical Journal, 1913, x., 201.

of this condition to the keratomalacia produced experimentally in rats by vitamin A deficiency. He at once inquired into the food provided to the boys and found that for a special reason the food was cooked in metal containers provided with a lid which was screwed down during the process of cooking. The food was therefore subjected to a process of autoclaving which is now known to destroy vitamin A. Dr. Findlay recommended a supply of cod-liver oil and swede juice, and the disease disappeared. I am greatly indebted to Dr. Findlay for allowing me to make use of this important and hitherto unpublished information.

There may be other conditions of malnutrition, especially in children, in which a deficiency of vitamins may prove to be an important ætiological factor. But it is not my intention to-night to discuss what diseases may, or may not be, due to vitamins. The fact that specific diseases can be produced by the absence of specific vitamins and can be cured as by magic by supplying the missing vitamins is striking and impressive. But this very impressiveness has obscured other phenomena related to the vitamins which, though less obvious and less striking, are of at least equal practical importance. I refer to what, for want of a better name, I have called the effects of "vitamin underfeeding." This may produce conditions of obscure ill-health, or it may not go as far as that, merely leading to an imperfect development of the organism, to deviations from the optimum which cannot even be called deviations from the normal. These effects are so little obvious that they have up to now been overlooked; in fact, according to the current conception of vitamins, they should not occur at all.

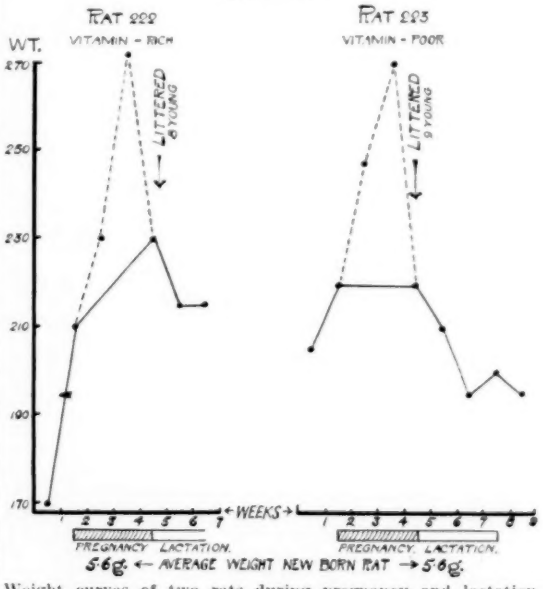
The following considerations will, perhaps, make my point clear. As a rule, we think of disease as an event superimposed upon the healthy organism. In such diseases as cholera, measles, syphilis, influenza, whooping-cough, diphtheria, and in fact all infectious diseases, we date the disease from the moment when infection occurred, even although the symptoms may not make their appearance for several days or weeks. There is a sharp dividing line between health and disease in these cases. Even in such a disease as cancer we date, mentally at any rate, the onset of the disease from the moment that a cell or a group of cells has acquired the property of autonomous growth which is the outstanding characteristic of a cancer cell. But in other groups of diseases it is impossible to date the onset of the disease. In such conditions as, for instance, myxœdema, Addison's disease, diabetes mellitus, acromegaly, it is, as a rule, impossible to draw even mentally a dividing line which would separate sharply a subnormal functioning of an endocrine organ from the actual disease. There is a borderland between health and disease when we consider the functional activity of the endocrine organs, and there is such a borderland also when we consider vitamins.

ANIMAL EXPERIMENTS ON VITAMIN UNDERFEEDING: EVIDENCE OF IMPERFECT DEVELOPMENT.

Experiments on animals have demonstrated that a highly differentiated organism requires for its full development a *maximum* supply of vitamins especially during the early period of its life. Any restriction of this supply leads to an imperfect development without necessarily producing obvious disease or obvious ill-health and without even preventing the process of reproduction. The result is an undersized, ill-bred population with a diminished resistance to disease—a "C 3" population. And I wish to stress this point: These results were obtained not with an artificial diet specially constructed with the intention of restricting the vitamin-supply but with a natural diet of bread and water, maize and rice, which was fixed upon empirically many years ago, after a good deal of experience, because it enabled this laboratory to maintain and rear a large population of rats economically and efficiently for experiments in connexion with cancer. Such experiments are of long duration, and it is essential for their success that spontaneous diseases and epidemics should not intervene. Fresh greenstuff was intentionally excluded from the diet, because it was found to give rise to epidemic outbreaks of enteritis.

From the practical point of view the diet appeared, therefore, to be adequate. In the light of our present knowledge it is clear, however, that its content in vitamins is restricted. It is also defective in respect of the proportion in which the inorganic elements are present. The diet contains little calcium and a preponderance of the acid-forming elements. Neither of these defects are sufficiently severe, however, to produce obvious ill-health or to interfere with the breeding and rearing of the stock. When this diet was supplemented by the addition of small amounts of preparations rich in vitamins, such as cod-liver oil for vitamin A and a yeast preparation for vitamin B, the stock improved markedly as indicated by a more rapid growth. This was especially striking when the pregnant and lactating mother was kept on the vitamin-rich diet. So far as the mother was concerned there was always a loss in weight of the mother during the period of pregnancy and lactation on the vitamin restricted laboratory diet alone, while with the addition of vitamins the mother actually gained in weight in most cases and never showed a loss (see Chart A). This means that on the vitamin-restricted diet the mother had to sacrifice her own tissues in order to nourish her offspring. The weight at birth of the litter on the whole was not smaller on the vitamin-restricted diet, but was actually larger.[3] The growth of the embryos in utero was, therefore, quite unaffected by the vitamin-supply. But as soon as the animals are born and become dependent upon the functional activity of the alimentary canal, the difference between the two diets becomes apparent. Not only the increase in weight and size, but also development, such as the growth of the fur, is more rapid on the diet supplemented with

CHART A.



Weight curves of two rats during pregnancy and lactation. Rat 223 was on the ordinary laboratory diet and therefore vitamin underfed. Rat 222 received the same diet supplemented with cod-liver oil and marmite. The broken line indicates the increase in weight during pregnancy due to the development of the embryos in utero. Note the pronounced loss of weight of the vitamin underfed rat during lactation.

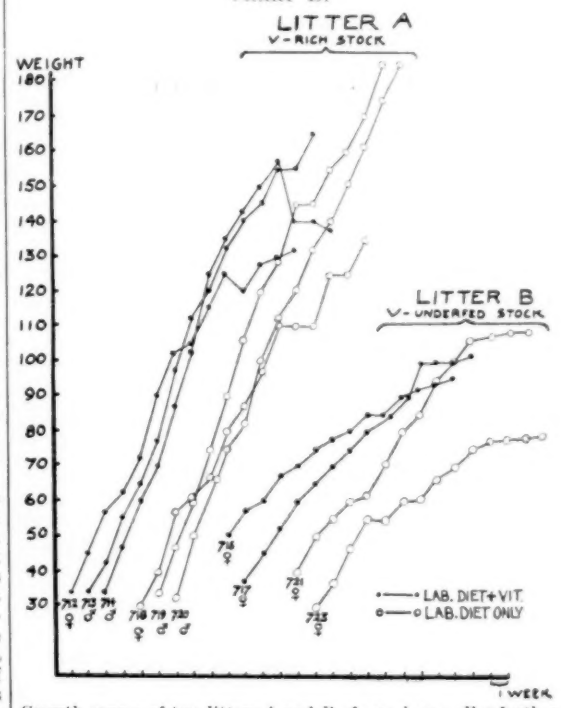
[3] Full data of these experiments have been given in a previous paper "On Vitamin Underfeeding," Brit. Jour. Exp. Path., 1922, iii., 298.

cod-liver oil and yeast. This difference persists and becomes more marked when after weaning the difference in the two diets is maintained.

We have now for nearly three years kept two stocks of rats on these two diets. The stock kept on the laboratory diet alone is called the "vitamin-underfed stock." In order to demonstrate this difference I have brought here two litters of the same age from these two stocks. These rats are now five months old, are sexually mature, and have passed the period of most active growth. The rats from the underfed stock are obviously undersized, but otherwise look normal, healthy animals. If one did not know their age one would from their weight and size take them to be much younger animals of the vitamin-rich stock. But there is a much more important and significant difference between the animals from these two stocks than mere difference in weight and size. This difference, which affects the whole make-up of the animal, manifests itself in different ways. For instance, when young rats from the vitamin-underfed stock are placed on a diet free from vitamin A their growth stops at once; within 8–10 weeks at the latest they develop the typical eye lesion and look ill and emaciated and die from some infective condition. The rats from the vitamin-rich stock continue to grow for a considerable time. Their growth may sometimes be more rapid than that of rats kept on the ordinary diet. For three or four months they look perfectly well and healthy, and the typical eye lesion develops two or three months after the death of the rats from the vitamin-underfed stock. I have maintained two rats on a completely vitamin-free diet for nine months before the eye lesion developed. These differences are obtained invariably and have been confirmed by other observers.

But this difference between the vitamin-rich and the vitamin-underfed stock manifests itself even when there is no attempt to produce a deficiency disease. When the diet of rats from a vitamin-underfed stock is supplemented with an ample supply of vitamins their growth may be a little improved, but it is not as rapid as the growth of the animals from the vitamin-rich stock. They never catch up in weight and size with the animals from the vitamin-rich stock. In a paper published a year ago I have given the chart of such an experiment.[4] But sometimes the growth is not improved at all. Conversely when rats from a vitamin-rich stock are subjected to vitamin underfeeding their growth is only slightly impaired and sometimes is not impaired at all. Results of this kind cannot be explained by assuming that this vitamin-rich stock has in its tissues a store of vitamins on which the animals can draw. In Chart B the result of another such experiment is given. It refers to two litters of known and equal age: Litter A from a vitamin-rich stock, litter B from a vitamin-underfed stock. When seven weeks old three rats of litter A were placed on the laboratory diet enriched with cod-liver oil and marmite. Similarly, three rats of litter B from the vitamin-underfed stock were placed on the vitamin-rich diet, while the other three rats were kept on the laboratory diet alone. Two rats died at the beginning of the experiment from lung infections and are not represented in the diagram. It will be seen from Chart B that in this experiment the growth of rats which came from a vitamin-rich stock and which since birth had received an ample supply of vitamins was not impaired by subsequent underfeeding of vitamins. Conversely, rats which came from a vitamin-underfed stock and for the first seven weeks after birth had been subjected to vitamin underfeeding, were not able to respond to an increased vitamin-supply by increased growth. They had received permanent damage as the result of the unfavourable dietetic conditions to which they had been subjected. Since rats of litter B come from a stock which had been subjected to vitamin underfeeding for several generations, we cannot differentiate between the effects of this underfeeding on the litter itself and on the previous generations. There is considerable evidence from the work of other workers, especially Orbone and Mendel, and McCollum and his collaborators, that defective nutrition has remote effects with cumulative action through successive generations, so that the physical condition of the stock becomes progressively worse. To simplify the argument we describe this experiment as underfeeding of litter B. But the possibility that the condition of this litter is due partly to the underfeeding practised on preceding generations adds further emphasis to the danger of vitamin underfeeding. Definite functional and anatomical differences can be noticed between certain corresponding organs and tissues of these two stocks. The lymphoid tissue of the vitamin-rich stock is functionally and anatomically more fully developed, and this is reflected by an increase in the number of lymphocytes in the circulating blood. The same holds good for the intestinal mucous membrane; in fact, in the vitamin-poor stock definite atrophic changes may sometimes be seen in the intestinal mucosa. In order to compare periods in the life of a rat with periods in the life of man it is necessary to multiply the former by about 20 times. Donaldson, in his book on the rat, gives an even higher figure (30 times). The length of life of a rat is three to four years and it is sexually mature after five to six months. The first four weeks in the life of a rat correspond therefore to the first two or three years in the life of a child. And underfeeding practised in a stock of rats for three years involves four to five generations.

CHART B.



Growth curves of two litters A and B of equal age. For further explanation see text.

MODE OF ACTION OF VITAMINS.

The significance of these observations is bound up with the problem of the mode of action of vitamins. The first investigators of the conditions produced by the complete absence of vitamins noticed no specific pathological lesions, and believed that the decline in health of the animal was due to a general decline of all its cells. The generalisation was formulated that all cells require a small amount of vitamins for their life and growth. If this amount is supplied the animal is held to be in normal health and to store

[4] THE LANCET, 1923, i., 1046.

the excess in its tissues. If less than the required amount of vitamins is supplied the health of the animal declines unless it has a store of vitamins in its tissues on which it is supposed it can draw. As already stated, the vitamins are supposed to have no positive physiological action of their own. The organism is regarded as a test-tube in which the cells of the organism are titrated against vitamins. If the quantitative relationship between these two reaches a certain proportion we have growth and health; if it falls below that—no growth and disease.

I have repeatedly criticised this view and pointed out that this conception is based on assumptions which do not agree with observed facts. Isolated cells can grow and live without vitamins, although a highly differentiated organism as a whole cannot. Vitamins have a positive physiological action corresponding to the action of hormones. There are specific pathological lesions produced when vitamins are withheld from the food, and these lesions account for the onset of the specific deficiency disease.

To take the last point first. In the absence of vitamin B there is invariably an anatomical and functional atrophy of the lymphoid tissue throughout the body, which is reflected in the circulating blood by a lymphopenia. In the absence of vitamin A there is an atrophy of the intestinal mucous membrane. There is a similar atrophy of one of the paraocular glands and also a great reduction in the number of blood platelets. Dr. R. G. Bannerman has informed me that he has been able to confirm this thrombopenia in rats kept on a diet free from vitamin A. These lesions account for the specific diseases produced by the absence of the two vitamins. If the atrophy of the lymphoid tissue is produced by some agency other than the deficiency of vitamin B, for instance, by exposure to radium, we get the same condition of marasmus that is characteristic of vitamin-B deficiency. In a paper published by Drew, Mottram, and myself in 1921, entitled "On the Function of the Lymphocyte and of Lymphoid Tissue in Nutrition," it was pointed out [5] that human pathology furnishes further evidence in support of the intimate relation of the lymphoid tissue to nutrition. The blood of infants and children contains four to five times the number of lymphocytes present in the blood of the adult. Disturbances of the adenoid tissue are of special significance in childhood and are known to be frequently associated with disturbances in nutrition. There are in infants extreme disturbances of nutrition which cannot be ascribed to neglect or deficient feeding. In such cases of marasmus, atrophy of the lymphoid tissue —thymus, spleen, Peyer's patches—are the main lesions found. An important function of the lymphoid tissue is, therefore, to maintain the nutrition of the body—a view which is also held by the French physiologist, Jolly, on similar grounds. An interesting confirmation of this view has been adduced quite recently by Carrel,[6] who, I regret to say, has not seen fit to acknowledge our work, from his observations on the cultivation of fibroblasts in vitro. He finds that these cells can only grow in serum when lymphocytes are added to it and argues from this that the lymphocytes synthetise from the serum substances necessary for growth. The condition produced by vitamin A deficiency is less well defined; it may be described as a condition beginning with vague ill-health and malnutrition which finally culminates in the onset of bacterial infections of an avirulent type affecting especially the eyes and the lymph glands in the neck. Frequently there is also an anæmia. A glance at Fig. 1, which represents two villi in the lower end of the small intestine stained for bacteria by Murray's Nile blue–Van Gieson method, shows how such a condition arises as the result of the pathological changes in the intestinal mucous membrane. The villi are not only atrophic as shown in figures published in a previous paper and have in part lost their epithelial covering, but the bacteria which in a normal animal are confined to the centre of the lumen of the intestine penetrate down between the villi and into the remotest recesses of the Lieberkühn's crypts. The mucous glands of the cæcum present a similar penetration by bacteria. A similar condition is produced by exposure to radium, as Mottram has shown. The effect of radium is established more rapidly and by following the changes Mottram [7] has been able to show that the primary effect is on the secretion of mucus at first. The mucin secreting cells increase in number and this is followed by atrophy. A similar change is visible in the intestinal mucous membrane of rats kept on diet free from the fat-soluble vitamin, but owing to the more chronic nature of the change, which may extend over several months, the sequence of this change is not so clear. In some parts the number of mucous cells is increased, but the cells are large and empty, with a wide opening towards the intestinal lumen. Bacteria may sometimes be seen in the empty vacuole. In other parts there may be a remarkable absence of mucin secreting cells. In a previous paper [8] I have given the figure of a mucous gland of the cæcum distended with bacteria. Reference to that figure will show a complete absence of mucous secreting cells. The necrotic and atrophic changes affecting the villi and the invasion of bacteria are probably the result of this primary effect on the secretion of mucus which has a protective action. The typical eye infection which is the most obvious sign of vitamin A deficiency can be explained in the same way. For Yudkin and Lambert have demonstrated profound atrophic changes in one of the paraocular glands—the Harderian gland. This gland resembles a mucous gland and has been described as such. These specific atrophic conditions disappear quickly when the specific vitamins are fed to the animals. Thus vitamin B stimulates the lymphoid tissue which rapidly regains its volume and functional activity so that the number of lymphocytes increases in the blood. Similarly the atrophy of the intestinal mucous membrane disappears when vitamin A is given, the blood-platelets rapidly increase, and the infections disappear.

This is in itself indication of a positive stimulating effect of the vitamins. But such an effect can be demonstrated not only in animals suffering from a vitamin deficiency but also in perfectly normal animals. Mottram, Drew, and I have shown that the absorption of food as indicated by the absorption of fat is greatly affected by the presence of vitamins. And Uhlmann, Voegtlin and Myers, Drummond and Anrep found that extracts of certain foods rich in vitamins when injected into the blood stimulate the pancreas to secrete. It is curious that this very significant fact has not received the attention which it deserves, presumably because it did not fit in with the current conception of the mode of action of vitamins. Another fact of considerable practical interest is the powerful stimulating effect on the appetite exerted by vitamin B, so that when this vitamin is absent from the food the appetite at once falls. All these observations taken together lead naturally to the conclusion that *vitamins are hormone-like substances present in the food.* They have a specific stimulating action on certain tissues, and these tissues themselves are dependent for their normal functional activity on the continued stimulation by these substances, in the same way as, for instance, the uterus is dependent on the ovarian hormone. We may describe, therefore, the vitamins as "food hormones," or "trophacoids," if we adopt Schäfer's nomenclature of calling the internal secretions "autacoids." And if we recall what tissues are dependent in this way on a continued extraneous supply of hormones in the food we find that they are mainly, though not exclusively, those which are concerned with the digestion, absorption, and assimilation of food—a very natural relationship.

[5] THE LANCET, 1921, ii., 1202.
[6] Journal Exper. Medicine, 1923, xxxviii., 513.
[7] Proc. Roy. Soc. of Medicine, Section of Electrotherapeutics, 1923, xvi.
[8] THE LANCET, 1923, i., 1046.

It is a very curious fact, too, that many of the tissues which are thus particularly sensitive to the extraneous agency of food hormones are sensitive also to another and quite different extraneous agency—namely, radiation. Exposure to radium will produce the same atrophic lesions and the same general effects as a deficiency in vitamins. Very small doses of these radiations produce a stimulating effect and there is an increase in the number of both lymphocytes and platelets. Another kind of radiation, light, has also a stimulating effect on the platelets and this may be the explanation of the curious fact that exposure to ultra-violet light delays the decline of an animal kept on a diet free from vitamin A. It has been said that it is difficult to understand on biochemical grounds how a physical agent such as light can take the place of an article of diet. It is, indeed, difficult, if we look upon a living highly differentiated organism as a test-tube in which quantitative chemical relationships exist between the cells and vitamins; and the only explanation which has been given on the basis of the chemical conception is that rats that receive light use vitamin A more economically. But from the biological point of view there is no difficulty in understanding that different stimuli—chemical, mechanical, electrical — when applied to living protoplasm produce the same effect. Light, however, does not have a stimulating effect on the intestinal epithelium or on the paraocular glands—at least in the doses which we have applied — and therefore the atrophic changes in these tissues due to the absence of the fat-soluble food hormone are not counteracted. It is interesting to remember that vitamin A is formed by plants in the presence of light. The more highly differentiated forms of animal life are not dependent for the maintenance of their functions on light to the same extent as plants, although light is still capable of stimulating the functional activities of some of their cells. The higher forms of animal life have instead become dependent for their well-being on the supply of a chemical substance for the formation of which light is necessary.

FIG. 1.

Lower end of small intestine of rat kept on a vitamin A free diet for seven weeks when the eye affection supervened. The animal was killed. Formol saline × 440. Stained with Nile blue–Van Gieson for bacteria. The bacteria have penetrated between the villi and into the Lieberkühn crypts. Note also the peculiar condition of the mucous cells.

THERAPEUTIC APPLICATION OF VITAMINS.

The significance of the conception of vitamins as food hormones from the point of view of evolution is obvious. Of more immediate practical application is the consideration that the need for these food hormones is greatest immediately after birth and in the first few years of life when the organism is adapting itself to a new environment and when the tissues which are stimulated functionally by the food hormones assume their functions. It is obvious also that this conception has a therapeutic application not confined to the deficiency diseases. We possess in these food hormones valuable drugs with a specific action. As a matter of fact, yeast had been used empirically, long before the existence of vitamins was known, as a remedy for two minor complaints, boils and constipation. Quite recently the use of yeast as a remedy for constipation has again been tested very carefully by Murlin,[9] and its value has been confirmed, and Gross has demonstrated the same for marmite, a yeast preparation rich in the water-soluble B.[10] We have seen that this food hormone stimulates the lymphoid tissue and this is probably the explanation of its usefulness in furunculosis. We have also seen that it affects favourably the processes of digestion and absorption in the intestinal canal, which would account for its use in relieving constipation. The constipating effect of the absence of vitamin B seems to be due to retention of the fæces in the large intestine and not to a general intestinal stasis, as has been stated, for unpublished observations by Dr. Mottram and myself showed that the passage of food through the small intestine is not delayed if vitamin B is absent. A direct result of this conception of food hormones has been the revival of their therapeutic application in certain forms of marasmus in infants not due to neglect or deficient feeding and therefore not due to a deficiency in vitamins. The functional atrophy of the lymphoid tissue and of the intestine, which is found post mortem in such cases, must therefore be regarded as a primary cause. It can be remedied by the active stimulation of these tissues by means of preparations richer in vitamins than milk. In practice it has been found that many cases of marasmus which have proved resistant to treatment by most careful feeding improve rapidly after the administration of cod-liver oil, malt, and orange juice. This is, in fact, an old empirical treatment which had fallen into disuse and which, during the last two years, has been applied again extensively. I am indebted for this information to Dr. D. Paterson, of the Hospital for Sick Children, Great Ormond-street.

[9] American Jour. of Physiology, 1923, lxiv.
[10] Journal of Pathology and Bacteriology, 1924, xxvii., 27.

From this conception of vitamins as food hormones it follows that their therapeutic application is not confined to the conditions which are caused by a deficiency in vitamins. Conversely, the fact that a vitamin relieves a disease does not necessarily prove that the disease was due to the deficiency in this particular vitamin. This consideration may help to clear up some difficulties and contradictions which have arisen. Thus the fact that cod-liver oil cures rickets does not necessarily prove that rickets is caused by a deficiency in any particular factor present in cod-liver oil. As a further example of the therapeutic value of these food hormones, the clinical observations by Hawk, Knowles, Rehfuss, and Clarke [11] may be mentioned. They studied the effect of a yeast preparation on a great number of different conditions such as furunculosis, acne, constipation, gastro-intestinal catarrh, &c. Seventy-six cases were treated, 66 improved or were cured, and apart from the improvement in the symptoms there was also a general improvement.

The therapeutic value of the fat-soluble food hormone is, of course, exemplified by the powerful therapeutic effect of cod-liver oil in a variety of different affections, especially infective conditions of a chronic kind such as tuberculosis. It may be that in these conditions this effect is partly related to its stimulating action in the formation of platelets. A good deal of experimental evidence, for which reference must be made to our previous papers, has accumulated recently which indicates that the platelets are a mechanism of defence against certain types of bacterial infections. It is suggestive that the two useful remedies in tuberculosis—cod-liver oil and light—both increase the number of platelets.[12]

But the most important therapeutic action of the fat-soluble trophacoid lies in its action on the intestinal mucous membrane. In a normally functioning intestine the bacterial and protozoal flora is confined to the centre of the intestine owing to the protective action of the mucus. Mr. C. J. Bond [13] has recently expressed the view based on experimental observations that mucus may play a biochemical as well as a mechanical part in the protection of mucous membranes against infection. When the normal functioning of the mucous secreting cells is impaired by a deficiency of vitamin A in the diet the bacteria and protozoa can be seen to attach themselves to the surface of the villi, to creep down between the villi into the crypts, and even into the atrophic mucous cells, and to proliferate there. In a previous paper I have given a drawing of a mucous gland of the cæcum distended with a mass of bacteria, and no mucous secreting cells are visible in that section. Cestodes also are present much more frequently in the intestine of rats kept on vitamin-deficient diets. As a rule, these bacteria and protozoa are of an avirulent type, and so the animal quickly recovers when vitamin A is administered in the form of cod-liver oil. But if the organism should be the carrier of a virulent bacterial or protozoal organism, then the conditions for an outbreak of a virulent specific infection are given. A very important experiment of this kind, carried out with monkeys, has been recorded by McCarrison,[14] who has also emphasised the importance of vitamins in the ætiology of gastro-intestinal disorders generally. The action of the fat-soluble food hormone on the mucous glands enables the intestine to keep in check its pathogenic inhabitants and thus confers protection against intestinal disease. And what applies to the intestine applies with equal force to the eyes. It is surely a suggestive fact that the two chief seats of disease in tropical countries, where the consumption of those articles of diet rich in vitamin A is necessarily restricted, are the eyes and the intestine.

[11] Journal American Medical Association, 1917, lxix., 1243.
[12] A striking clinical example of such a relationship has been published recently by R. G. Bannerman, Brit. Jour. Exp. Path., 1924, v., 16.
[13] Brit. Med. Jour., 1921, ii., 974.
[14] THE LANCET, 1922, i., 208.

PROBABLE VITAMIN UNDERFEEDING OF THE POORER CLASSES.

And now I come to what I believe is the most important aspect of vitamin dietetics. If we compare these apparently healthy but under-sized rats of litter B, in which out of six rats two rats kept in separate cages died from lung infections when they were only a few weeks old, with the big, well-developed animals of litter A, all of which survived, if we remember that both litters received the same basal diet and that the only difference was that the animals of litter A came from a stock which had received through several generations an additional supply of vitamins in the form of a yeast preparation and of cod-liver oil—and if we then consider the large number of under-sized, ill-developed children and adults that we can see any day in the streets of any big town, the question is forced upon us: Is this vitamin underfeeding—of which litter B is an example, and which has been going on in our laboratories quite unintentionally for many years, without any gross evidence of disease—going on on a large scale in our population? The main articles of diet for the poorer classes are bread, margarine and jam, meat and potatoes, and for the smaller children milk. The main supply of the water-soluble food hormone B ought to be bread, since whole-meal flour is abundant in this vitamin. But the white bread of to-day is poor in this vitamin, because as the result of the fine milling those parts of the wheat grain that contain this vitamin are eliminated. Bread used to be called "the staff of life," but that was a long time ago when whole-meal bread was used. Our bread of to-day had better be called "a broken reed." In the diet mentioned, potatoes are practically the only source of vitamin B—and they are not rich in this substance. The substitution of margarine for butter deprives us of the main supply of vitamin A. Many brands of margarine are completely free from this vitamin, some contain a small amount of vitamin A, but not as much as butter. There remains only milk as the remaining source of vitamins provided that whole milk is given and not milk that has been deprived partly or entirely of its fat, and thereby of vitamin A. And the boiling of the milk, which is rendered necessary in the present unsatisfactory state of the milk-supply in big towns, further reduces the amount of vitamins that may be present. It will be remembered that on a very similar diet in a Danish institution the outbreak of keratomalacia occurred which Bloch investigated. The well-to-do classes make up for this by a consumption of eggs, butter, green vegetables and salads, and fruit, all of which are rich in vitamins. I do not see how it can be denied that under present conditions of town life large classes of the population live on a diet which contains only a small fraction of the food hormones present in the food in its natural state. This defect in our diet has also been pointed out by McCarrison, and in America by Osborne. The prevalence of constipation is a good indicator of an underfeeding of the water-soluble food hormone. It was recognised long before we knew anything about vitamins that the use of white bread was responsible for constipation, and that the latter disappeared with the substitution of whole-meal bread for white bread. It was then believed that the presence of indigestible cellulose material in brown bread acted as a mechanical stimulus to the intestine. But since this constipation can also be remedied by giving vitamin B in the form of yeast, the cause of the constipation must be sought in underfeeding with vitamin B, and not in the absence of a mechanical stimulus. If we consider that bread ought to be the main supply of vitamin B in the diet it is startling to remember that an outbreak of beri-beri occurred among the British troops in Mesopotamia when they were living on rations of white bread and tinned meat.

We have seen that certain tissues or groups of cells are dependent for their full functional activity on the continued stimulation by the food hormones, that their activity declines as we diminish the supply of

these food hormones until we get atrophy with the prolonged complete absence of food hormones. There is no hard-and-fast line where disease begins and health ends, but a whole series of gradations of functional activity. The so-called deficiency diseases in their typical form represent merely the extreme end of this series. The intermediate stages of chronic vitamin underfeeding may manifest themselves only in a young organism by less rapid growth or not at all until the occurrence of incidental disease superimposes a new strain upon the organism. Thus, in our vitamin-underfed rats the lymphoid tissue and the intestinal mucosa are not as well developed as in the rats from the vitamin-rich stock; in fact, the intestinal mucosa frequently shows atrophic changes approaching those seen in vitamin A deficiency, and spontaneous lung affections are much more frequent than in the vitamin-rich stock. This difference refers to underfeeding in vitamin A and B, since rats are not dependent on a supply of vitamin C. Marshall Findlay[15] has induced a condition of "latent scurvy" in guinea-pigs by underfeeding them with vitamin C. Such animals present, like our rats, no obvious external signs of ill-health. Histological examination shows, however, that the blood-forming bone-marrow is atrophic, and when these animals are experimentally infected with pathogenic bacteria it is found that their resistance to such infection is greatly diminished. Some interesting clinical evidence bearing on this point has been recorded by Hess, of New York,[16] whose work on rickets is so well known. He observed in 1913 in a group of children which had been fed on pasteurised milk a widespread grippe infection with hæmorrhagic skin manifestations. He attributed this to a "scorbutic taint" in these children, and brought about a disappearance of these skin manifestations by the administration of orange juice. Hess also draws attention to the frequent coincidence of nasal diphtheria and what he calls "latent" scurvy. When a large number of cases of nasal diphtheria develop, suspicion should be aroused that the infection is implanted in tissues weakened by scorbutic or other nutritional disorders. He also quotes Davidsohn, who attributes the spread of tuberculosis in Central Europe during the war to a defective supply of vitamins.

Many clinicians have been sceptical about the importance of vitamins in the ætiology of disease, because typical deficiency diseases as they are induced in the laboratory experiments by complete deficiency in vitamins are a rare occurrence in our population (though, as we have seen, they do occur), and because the complete absence of one or other vitamin from the food of people living on a mixed diet can only occur in exceptional circumstances. But what the clinicians are likely to meet with, according to the conception which I have laid before you, are the results not of an acute complete vitamin deficiency but of chronic vitamin underfeeding. On this point Hess's views are most instructive. From his clinical experience he urges clinicians to realise that—

> "the harmful effects of food deficiencies should not be associated in our minds essentially or chiefly with specific diseases such as scurvy or rickets, but rather as disorders of nutrition, producing slight and manifold disturbances of function. It is probable that every organ or system in the body may be affected by faulty nutrition. For example, involvement of the eyes may lead to impaired vision or night-blindness; or, on the other hand, neuritis, cardiac enlargement, disturbances of the circulating system, atrophic disorders of the skin, nails or hair, caries of the teeth, or unaccountable lack of appetite and constipation may each in turn be the earliest symptom. A more careful inquiry into the dietary of patients will result in bringing to light many cases in which vague and ill-defined symptoms can be remedied simply by rendering the diet adequate."[17]

Before I conclude I wish to revert once more to an important point. It is the infant and the child and therefore also the pregnant and nursing mother who is particularly in need of an abundant supply of these food hormones. Experimentally, it is a well-established fact that the younger the animal the more rapidly does it succumb to a deficiency in vitamins. Clinically, the most obvious and typical results of vitamin deficiencies have been observed in children, and you will have noticed that most of the clinical evidence which I have presented to you refers to children. From our conception of the vitamins as food hormones it is easy to understand why that should be so. The alimentary canal does not begin its function until birth, and we know that it is a most vulnerable part of the infant's organism. Its functional development is moulded, so to speak, by the stimulation it receives through the food hormones. If their supply is restricted, the functional development will be impaired, and a lasting damage may be inflicted which cannot be made good by an ample supply of vitamins in later life.

That is the pessimistic view. But the optimist may point out in reply: If care is taken to ensure an abundant supply of vitamins to the pregnant and nursing mother and to the child in the first few years of its life a lasting benefit will be conferred upon the child. The intestine and the other tissues that are susceptible to the stimulus provided by the food hormones can thus and only thus attain their full functional activity. I do not wish to exaggerate the importance of vitamins. I do not wish to give the impression that they are a panacea for all ills, and that if we could only ensure an ample supply of vitamins to everybody we should all live happily ever after. It is, in fact, an essential part of my argument that the action of vitamins is not a vague general action on all cells, but an action circumscribed in the same sense that the action of a hormone is circumscribed. But I think the statement is justified that we have allowed our basal articles of food to be deprived of their vitamins, with the possible result that large classes of our population may be suffering from vitamin underfeeding, and living in the border-land between health and disease. If that is so, we are facing a big social problem. But, unlike many other problems of this kind, it is a problem scientifically circumscribed which will be remedied, as soon as its existence is generally recognised, by a demand for bread which contains an ample supply of vitamin B and for margarine with an ample supply of vitamin A, and by realising the importance of whole milk and the inadequacy of skimmed milk in the feeding of children.

EXPERIMENTS IN NOURISHMENT OF CHILDREN.

How big this problem is, to what extent of vitamin underfeeding our population is subjected, can only be determined by experiments on man on a large scale. An experiment of this kind has already been carried out in America in some of the board schools in Chicago, and has been reported on by Dr. Katharine Rich.[18] The experiment was carried out because the startling discovery was made that 53 per cent. of the children of 14 applying for employment certificates were from 7 per cent. to 21 per cent. below the average child of that age and when employed could not carry out their usual amount of work. This defective condition was found to be due to faulty nourishment and was remedied mainly by correcting the diet. By ensuring the consumption of an ample amount of milk, and by instruction on the value of personal hygiene and cleanliness, an average gain was recorded within less than a year of 121 per cent. in weight and 64 per cent. in height in excess of the usual gain. These observations, which were made on 500 children, were not expressly designed to test whether the defective physical condition of these children was due specifically to vitamin underfeeding. There may have been other dietetic errors which were also corrected by the increased consumption of milk. For the distribution of food hormones in the basal articles of

[15] Journal of Pathology and Bacteriology, 1923, xxvi., 1.
[16] Journal American Medical Association, 1921, lxxvi., 693.
[17] Ibid.
[18] Journal American Medical Association, 1920, lxxv., 226, 1492; 1921, lxxvi., 998.

our diet is such that a deficiency in vitamin is usually accompanied by other deficiencies. Milk is particularly rich in calcium salts, and margarine is poor not only in vitamins but also in calcium salts as compared with butter. It may, in fact, be taken as a practical guide that if a diet composed of natural basal articles of food contains an ample supply of vitamins it is correct also in other respects. It should always be remembered that to correct the deficiency of our diet in food hormones by the addition of cod-liver oil for the fat-soluble A and malt or a yeast preparation such as marmite for the water-soluble B is only a makeshift.

The great value of the Chicago experiment, in which the dietetic faults were corrected not by a free supply of milk but merely by instruction and supervision, consists in having shown that such an experiment is practicable, inexpensive, and successful beyond expectation. From what has been pointed out in this paper, it would be even better to begin with the beginning, and in selected groups of families who are at present living in a condition of vitamin underfeeding to carry out an experiment of this kind on the pregnant and nursing mothers and on the children in the first years of life.

A COMMUNICATION BETWEEN THE VAGUS AND THE CERVICAL SYMPATHETIC,

WITH ITS CLINICAL ASPECTS.

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THE recent operations performed by Jonnesco for the treatment of angina pectoris, in which he extirpates the middle and inferior cervical sympathetic ganglia, directs attention to the anatomical communications of these structures. It is the primary object of this paper to describe some of these connexions which pass between the inferior and middle cervical sympathetic ganglia and the vagus nerve with its branch, the recurrent laryngeal—including their detailed distribution, which appear to have hitherto escaped particular notice—and secondarily to draw attention to the clinical aspects of these associations.

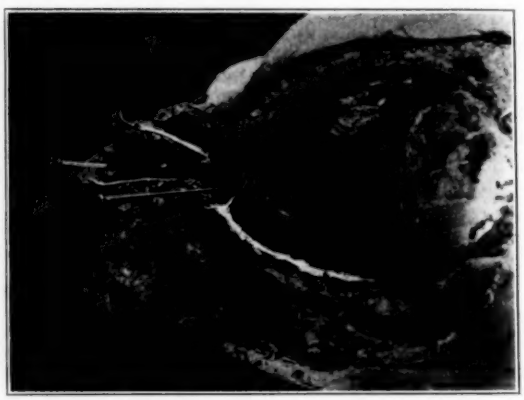
Anatomy.

Examination of the connexions of the inferior cervical ganglion on various occasions showed that a direct nervous link was frequently present between the right vagus and this structure, and in addition there was sometimes seen to be a communication between the middle cervical ganglion and the vagus. In the literature dealing with these parts no mention is made of any such direct link between vagus and sympathetic, although Cunningham describes the connexion between the recurrent laryngeal and the third cervical ganglion. Swan's work on the "Nerves of the Human Body" contains a plate illustrating a nerve joining the right vagus below the origin of the recurrent laryngeal, which appears to arise from the loop between the second and third cervical ganglia, but he gives no description of it. Twenty-five bodies, including three fœtuses, were examined for communications between the vagus and inferior cervical ganglion, which resulted in its presence being confirmed in 14 of the adult bodies, and in all three fœtuses—that is, in 68 per cent. of the specimens investigated. With regard to this percentage, it must be mentioned that the adult bodies were being dissected by students, which necessitated waiting for the removal of the lungs and the deep dissection of the neck before one could examine the region in question, a factor which might contribute to the number of negative instances, since this communication is almost invariably torn away if the mediastinal pleura near the apex be roughly removed. In this respect it is noteworthy that it was found in all three fœtuses.

The Relations of Vagus and Cervical Sympathetic.

The nerve passes from the inferior cervical sympathetic ganglion downwards, inwards and forwards to the right vagus just below the point where that nerve crosses the first part of the right subclavian artery; it is therefore lying in a very oblique plane in relation to the inner side of the pulmonary apex, amidst the subpleural connective tissue. At its sympathetic extremity it is closely related to the brachial division of the first dorsal nerve and the first rib; passing downwards beneath the subclavian artery it is in juxtaposition to the loop between the inferior and middle cervical ganglia. Close to its inner side is the branch from the inferior cervical ganglion to the deep cardiac plexus, and often several sympathetic filaments to the œsophagus and trachea. The general anatomical relations of this nerve will be seen in Fig. 1, which shows one of the fœtal dissections.

FIG. 1.



General anatomical relations of cervical sympathetic, from a fœtal dissection. The vagus, the sympathetic, and the communicating nerve are painted white; the nails are inserted in the severed ends of the right common carotid and right subclavian arteries respectively. The phrenic nerve is seen crossing the pericardial sac. The recurrent laryngeal passed inwards in contact with the under-surface of the subclavian artery at the point of junction of the communicating branch with the vagus; consequently it is not shown.

Preliminary to describing the detailed connexions of the vagal extremity, it is opportune to mention the method by which these were traced. The vagus and sympathetic and their communication in this region were removed en masse, and dissected under water with the aid of a lens; in this way it was easy to trace the largest fasciculi, and possible to follow them still further with the aid of transmitted light, dissecting across the aperture of a shaded electric lantern. The application of a fat solvent was also found to be useful; for this purpose benzine was swabbed over the fibres, which freed them from adherent fatty tissue, revealing the sharp outline of the nerve.

In describing the detailed connexions of this vago-sympathetic communication, it will be advisable to consider the two sides separately on account of the difference presented; further, it may here be remarked that although the communication to be most particularly described passes from the inferior cervical sympathetic ganglion, there was noted in several of the specimens examined a similar link with the vagus proceeding from the middle cervical sympathetic ganglion; the connexion of the former nerve will be detailed first on the right side.

Sympathetic Extremity.—The origin of this communicating nerve from the inferior cervical ganglion was generally found to consist of two small branches, given off from the ventral surface of the ganglion, which immediately united to form the nervous link. Though this description is generally applicable, a

variation in the mode of origin was observed. In two of the specimens examined the nerve had an additional root from the cervical sympathetic chain which separated from that structure at a distance of about one inch above the inferior cervical ganglion; there were also the usual two roots from the latter which, after uniting, passed forward to join the third root and form the characteristic vagal connexion.

Vagal Extremity.—This end of the nerve usually presents a scheme of subdivision that may be accepted as characteristic of the structure—namely, a Y-shaped division—one portion passing downwards to the vagus, and the other entering the recurrent laryngeal a few millimetres from where the latter leaves the vagus. As a variation of this almost constant distribution, it was occasionally noted that the communicating nerve proceeded to the precise point of origin of the recurrent laryngeal, in which case the Y division was absent, whilst in one specimen the nerve joined the recurrent laryngeal about one inch from the origin of the latter from the vagus.

FIG. 2.

Drawing from microphotograph, showing large medullated fibres principally concentrated in a small bundle on the periphery of the nerve, a few being also scattered about the bundles.

Distribution.—This may be most readily followed with the aid of the diagrammatic representation (Fig. 5). Here the inferior of the two main divisions entered the lower border of the vagus, wherein many of its fibres could be traced as far as the branches to the deep cardiac plexus. The other principal division entered the recurrent laryngeal a few millimetres from its commencement. Herein it underwent a distribution such that the part proceeded peripherally (*e*) in the recurrent nerve; the remainder ascended to the vagus and divided into ascending and descending branches. The latter (*g*) could be distinctly traced into the centre of the vagus, which point is emphasised to show that the fibres are not merely adherent to the surface of that nerve, but definitely incorporated therein, a fact which was also definitely shown by histological examination, to be referred to later. These caudal fibres were traceable as far as the plexus gulæ, but no filaments appeared to emanate in the direction of the cardiac or pulmonary plexus. The cranially directed division also passed into the interior of the vagus, but was lost after tracing it about one inch, the fibres becoming intimately intermingled with those of the vagus. As a slight variation to this distribution the specimens which showed a three-fold sympathetic origin on approaching the recurrent laryngeal about an inch from the latter's origin, gave an accession of fibres to that nerve by a separate branch, the fibres of which passed in a peripheral direction. It then adhered to the recurrent nerve, many of its remaining fibres passing on in a distinct cardiac branch, while the others appeared to decussate with the recurrent fibres and ascend to the vagus.

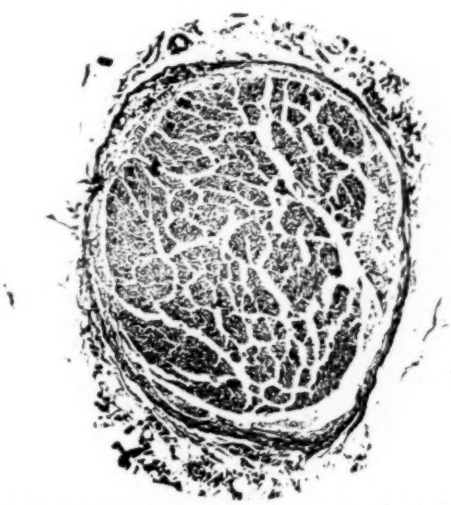
Left Side of the Body.—The anatomical connexions between the vagus and the sympathetic differ somewhat from those above described; in only one of the dissections was there any trace of a direct vago-sympathetic connexion, and this was in a fœtus. In this sole occurrence the distribution was precisely similar to that found on the right side; the branch from the inferior cervical ganglion having the same dual origin, and was distributed on reaching the vagus in the characteristic Y-shaped manner, some of the fibres ascending and others descending, the only exception being the absence of a branch to the recurrent laryngeal. In many of the remaining specimens examined the place of the communicating branch would appear to be taken by several large fasciculi, which passed from the third cervical ganglion to join the recurrent laryngeal. This arrangement was met with in ten adult bodies examined, but in six others the branches from the inferior cervical ganglion were found to pass independently to the deep cardiac plexus.

Distribution of Branches.—Dissections of these recurrent sympathetic communicating nerves demonstrated that on joining the laryngeal nerve their fibres are distributed in both directions, some

FIG. 3.

Funicular type of communicating nerve surrounded by loose connective tissue, containing small blood-vessels, which form the epineural sheath; internal to this is the nerve proper, subdivided into funicular bundles, each surrounded by a definite perineural sheath of fibrous tissue.

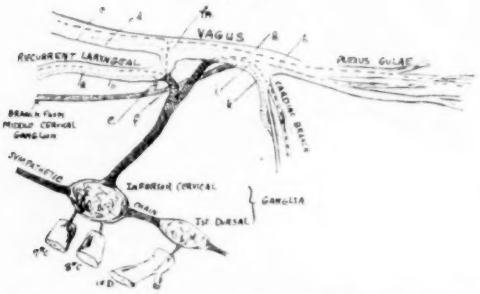
FIG. 4.



Non-funicular type of communicating nerve, showing loose epineural tissue surrounding a single perineural sheath, enclosing the entire nerve, the fibres of which are segregated into bundles, only separated by a very scanty endoneural tissue.

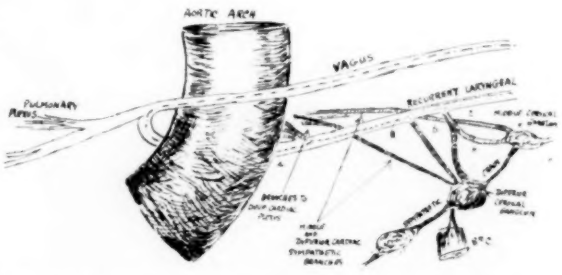
ascending towards the larynx; others descending in this nerve appeared to leave it mainly by several branches to the aortic and deep cardiac plexus, at the point where the recurrent laryngeal passes behind the arch of the aorta in close relationship with the commencement of the left bronchus (Fig. 6). The descending fibres are shown by the interrupted line *a*; it was thought that in the specimens dissected some of the fibres continued beyond the origin of the cardio-aortic branches to ascend to the vagus trunk, but with regard to this point one cannot speak with certainty, although such a distribution is to be expected from the analogy of the right side and from comparison with the one example of a direct vago-sympathetic link on the left side. The presumed course of such fibres is shown by the line *d*. H is the middle cervico-laryngeal communication quite independent of the middle cardiac branch from the ganglion.

FIG. 5.



(*a*) Fibres from middle cervical communication passing peripherally in the recurrent nerve. (*b*) Fibres from inferior cervical communication passing in same direction as above. (*c*) Fibres ascending in vagus from inferior communication. (*d*) The same from the middle communication. (*e*) Branch of middle cervical link to the recurrent laryngeal. (*f*) Branch of same to vagus. (*g*) Fibres from inferior communication descending the vagus. (*h*) Thoracic cardiac branches of vagus. (*i*) Fibres from inferior communication passing into cardiac branches of vagus. (*k*) Same from the middle communication. (*m*) Fibres descending in the vagus from the middle and inferior communications via the recurrent nerve.

FIG. 6.



(*a*) Fibres passing down the recurrent nerve from the inferior and middle communications. (*b*) Inferior cervical sympathetic communications to the recurrent laryngeal nerve. (*c*) Peripheral fibres in the recurrent nerve from the inferior and middle sympathetic communication. (*d*) Fibres ascending from recurrent nerve to the vagus. (*h*) Middle cervico-laryngeal communication.

Middle Cervical Ganglionic Branch.

Besides these connexions between the inferior cervical ganglion and the vagus the presence of another sympathetic link with that nerve from the middle cervical ganglion was noted in several instances. Following the previous plan, the right side may be described first. The nerve was observed in eight of the 25 specimens examined. Its general relations are practically those of the communication just described, running obliquely downwards, inwards, and slightly forwards beneath the first part of the right subclavian artery in close relationship with its vertebral branch, the vagal link with the inferior ganglion, and also with the annulus of Vieussens.

Vagal Connexions.—This nerve was seen either to join the recurrent laryngeal or to divide, one portion going to the last-named nerve, the remainder to the vagus.

Intraneural Distribution.—The details of the distribution of these branches within the vagus and recurrent laryngeal will be more readily appreciated from a study of the diagram (Fig. 5), where the detailed connexions will be observed to be very similar to those of the branch from the inferior ganglion. The twig to the recurrent laryngeal (*e*) divides on entering that nerve, one portion of the fibres passing in a peripheral direction, the remainder are centripetal in their course. The latter on reaching the vagus subdivide into cranial and caudal divisions (*d* and *m*). This manner of distribution was found in both types above mentioned, although as an addition in the second type the principal accession of fibres was to the vagus below the junction of the inferior cervical ganglionic branch. These fibres (K) were traceable into the deep cardiac branches of the vagus, whilst others appeared to be merely adherent to that nerve and to separate from it with the cardiac filaments. On the left side of the body this middle cervico-vagal communication was also represented. It was present both in the dissection which revealed the direct vago-sympathetic link, and in those where the connexion was established with the recurrent laryngeal. This nerve was quite independent of the middle cardiac branch from the ganglion, and as shown in Fig. 6 by the line H.

Distribution on Left Side.—A closer examination proved this to follow the usual bifurcate arrangement, branches both ascending and descending in the recurrent laryngeal.

Having discussed these vago-sympathetic communications from the purely anatomical aspect, one must attempt an elucidation of their physiological function in order to interpret their clinical significance.

Histology.

General Structure.—The general construction of this nerve in man appears to follow two definite formations depending on the presence or absence of funiculi; the usual construction is the funicular type seen in most nerves (see Fig. 3). In contrast to this formation is the appearance presented by the non-funicular type (see Fig. 4), where the loose epineural tissue surrounds a single perineural sheath enclosing the entire nerve, the fibres of which are segregated into bundles, only separated by a very scanty endoneural tissue.

Detailed Structure.—Turning to the detailed structure, the non-funicular nerve contained the two general types of fibres, the myelinated and non-myelinated; although there are many small groups of the latter type evenly distributed throughout the bundle, there appeared to be a general preponderance of the myelinated type, which, according to their relative size, may be classified into three main groups. It should, however, be remembered that although the extremes of these groups are distinct from each other, there are intermediate sizes which render this classification very wide. The smallest type of myelinated fibres, as measured by a micrometer eyepiece, were from 1 to 3 μ in diameter; these are distributed generally over the funiculus, and are distinctly the most numerous of their class. They may be compared to the small vagal medullated fibres which convey inhibitory impulses, and in this respect, also, to the similar splanchnic fibres. The next in frequency are the medium-sized medullated fibres which vary in diameter from 6 to 8 μ; like the former they are evenly

distributed amongst the fasciculi. Lastly, there is the group of large medullated fibres which have a diameter between 10 and 13 μ; these are distinctly the least numerous of the constituent elements. In the specimen described they were principally concentrated in a small bundle on the periphery of the nerve (see Fig. 2), whilst a few were scattered about the bundles; in all about 25 of these largest fibres could be distinctly counted. In their size they may be compared to the large vagal and large sympathetic fibres described by Gaskell and Edgeworth, although the fibres classified as medium-sized in the present example would more strictly compare with the large fibres of these investigators, the largest fibre in the human specimens considerably exceeding them. They are likewise strictly comparable with the large afferent sympathetic fibres of Langley, which he associates with the capsular end-organs. In the funicular type the same general division of the constituent elements pertains, but with this distinct difference—that there is a great preponderance of the medium-sized medullated fibres averaging from 5 to 6 μ in diameter, comparing with Edgeworth's large sympathetic fibres. The small myelinated and non-myelinated types are relatively scanty, whilst the largest medullated fibres in this specimen averaged 7 to 10 μ in diameter, and although mainly present in a small funiculus were more generally distributed than in the previous example, in this case 24 fibres could be distinguished with certainty. A section across the cervical sympathetic chain above the inferior ganglion showed no presence of the largest medullated fibres, the majority of the myelinated fibres were of the small variety, measuring about 1 to 3 μ, although one or two were from 4 to 5 μ in size, the remainder being of the non-myelinated type.

Turning to the inferior cervical ganglion, a longitudinal section of that structure, passing through the origin of the vagal communication and the lower end of the cervical sympathetic chain, revealed an interesting feature; numerous ganglion cells can be seen in the origin of the latter, whilst the commencement of the vagal communication is devoid of this feature. It will be recalled that whereas the non-medullated fibres are the post-ganglionic axons of the cells in the lateral sympathetic chain, the medullated fibres, on the other hand, make no synaptic connexions in these ganglia; hence the significance of the nerve cells continuing into the cervical sympathetic chain, which contained many more non-myelinated fibres than the vagal communication, where the other variety predominate.

The course of these large sympathetic fibres was still further defined by examination of sections across the vagus above and below its junction with the vago-sympathetic communication. Above the connexion no medullated fibres in the vagus were found to exceed 6 to 7 μ in diameter, whereas after the accession of the sympathetic nerve large medullated fibres of 10 μ diameter make their appearance scattered about the vagus. In both localities many non-myelinated and small and medium myelinated fibres are present, the smaller size of the latter type averaging about 1 to 2 μ.

All of this evidence tends the more fully to show that the distribution of these largest medullated sympathetic fibres in man compares almost precisely with the course of the similar large fibres in the dog as described by Edgeworth—with this difference, that the human example exceeds the other in average size, although 10 to 12 μ fibres of a similar nature have been found in animals, as described by Langley.

We may therefore conclude that the inferior cervico-vagal communication mediates both afferent and efferent impulses, and that in respect to the former it transmits a specialised type of fibre, the large myelinated variety, probably mediating afferent impulses from capsular end-organs, which structures, according to the cases examined, must be situated in the visceral distribution of the vagus.

Clinical Aspects.

From the clinical side it would appear that the importance of these vago-sympathetic fibres depends upon their two main spheres of distribution: (1) To the cardio-aortic region, and (2) to the thyroid gland. In the former association they mediate, at least in some cases, as shown by the success of Jonnesco's operation, the critical nervous impulses of angina pectoris, transmitting the afferent stimuli from the heart and aorta, and very probably transmitting efferent stimuli to that region. These nerves form a concentration point for the sympathetic cardiac fibres from the upper dorsal segments, and as such present a readily accessible isthmus at which to attack the vicious cycle of irritation by surgical methods. In the latter association these same communicating nerves probably mediate secreting fibres to the thyroid, and it is the pathological hyper-excitability of such fibres which may form a most important ætiological factor in the production of exophthalmic goitre; consequently, in suitable cases, in association with the other cervical sympathetic ganglia, their extirpation would appear to be justified in this disease as judged by the results of Jonnesco's work.

In conclusion, I must express my thanks to Prof. J. S. B. Stopford for his helpful criticism and for facilitating the work in many ways.

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THE MENTAL CONDITIONS FOUND IN CERTAIN SEXUAL OFFENDERS.

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IN this paper I have endeavoured to indicate the mental conditions which may be discovered in the intensive study of cases of two kinds of "sexual" offence—namely, indecent exposure and indecent assault. All persons accused of either of these offences are closely studied when received at this prison. The results which are briefly described here are those obtained by the examination of a series of 100 cases (50 cases of either offence). The majority of these were studied before conviction, a point of great importance which will be referred to again. Every case of these offences received here during a period of about three years has been included in the series, with 26 exceptions. These exceptions comprised 15 cases of indecent exposure and 11 cases of indecent assault, in which the accused persons consistently protested their innocence, asserting either that there was a mistake in identification, or, in the cases of charges of indecent exposure, that there had been no improper intention, the usual explanation being that they were urinating in some more or less public place, under the impression that there was no one to observe them. I have, consequently, included in my series only those cases in which the accused man frankly admitted his guilt.

Some of the omitted cases were ultimately found not guilty. I do not wish, in the least degree, to suggest that the remainder of the omitted cases were improperly convicted. There was often overwhelming evidence that the explanation given by the offender was untrue. But it is to be remembered that in these, more perhaps than in any other offences, there is need to consider the psychology of the witness as well as that of the accused. This point is often overlooked. The evidence in these cases is often that of

children or young girls. It is not likely that deliberate perjury or false accusation is common. But quite apart from these conditions there is much need for caution. The degree of memory and the type of memory varies greatly in different persons. And all who have studied children psychologically are well aware of their high degree of susceptibility to the influence of suggestion, their vivid imagination, and their habit of believing in the reality of their fantasies. And the desire to create a sensation, and to take the centre of the stage, must not be forgotten, both of these conditions having a psychological explanation. All this indicates the necessity for consideration of the psychology of the witness. It is true that the law most properly requires some corroboration of the testimony of a child. But in this particular type of case the fact of having complained without delay to a parent or some other person is often taken as sufficient corroboration.

Consideration of Proven Cases Only.

While this question of the value of evidence in criminal trials is of great interest psychologically, and of great importance practically, we are not directly concerned with it here. My desire has been simply to present a series of cases in which there could be no possible doubt that we were dealing, in every instance, with an actual case of the offence charged. This point is of importance. In other published studies of series of offences of various kinds there has often been a considerable element of doubt on this head. The conditions found in the omitted cases were just as varied as those found in the cases included in the series. And had the statistics of the omitted cases been included, the percentages would not have been materially affected.

There are two main reasons for paying special attention to these particular offences. First, they form a fairly homogeneous group, and in this respect they differ from certain other offences—e.g., dishonesty—in which the accompanying circumstances may be of the most varied character. Secondly, there is general agreement that offences of the kind described in this paper are specially deserving of investigation. It is not always easy to persuade those who have not made a deep study of the subject that a case of larceny, for example, may appear, superficially, to be quite simple, and yet may be due to most obscure mental causative factors. But in the case of these "sexual" offenders there is a general feeling that we are dealing with something abnormal. As a consequence, courts of law are often much more willing to remand the accused person for purposes of examination before finally dealing with him.

Great Variety of Mental Conditions.

It is to the great variety of the mental conditions which may be found that I desire to call special attention. And the general results obtained by examination are set out in the following table:—

	Indecent exposure.	Indecent assault.	Total.
Insane	4	4	8
Mentally defective	11	15	26
Subnormal intelligence	2	2	4
Undeveloped physically and mentally	—	1	1
Senile degeneration	4	7	11
Epileptic	2	—	2
Mental conflict	18	13	31
Negative results	9	8	17
	50	50	100

The cases described as insane were, of course, all certified as such, and removed to mental hospitals. There were four cases of dementia præcox, two of senile dementia, and two of confusional insanity.

The cases of mental defect were all estimated by my special scheme of tests,[1] supplemented, in most instances, by the Terman scale applied by another examiner. There were six imbeciles, three in either group. Of the 26 cases of mental defect, 18 were certified under the Mental Deficiency Act, 1913, and removed to institutions for defectives. In two cases, although the mental defect was undoubted, there was difficulty in proving its existence "from an early age," as is required by the definition in the Act. This difficulty is now generally recognised as being a bar to the full usefulness of the Act. One of these latter cases was that of a man aged 63 years, who had 29 previous convictions for offences of this kind, but of whom it was impossible to obtain any history earlier than the age of 30 years. The remaining cases classed as mental defectives were placed under supervision, except in one instance, where the offender was rather oddly dealt with by being placed on probation.

The cases described as of subnormal intelligence were those in which there was some degree of mental defect, but in which this did not appear to be sufficiently marked to justify certification under the Mental Deficiency Act. What degree of mental defect should justify such certification is a matter for argument. But I am not prepared to accept the conventional rule, adopted in some quarters, which holds that the non-attainment of some particular "mental age," as determined by the Terman or other similar scale, should be the decisive factor in the question of certification. The expression "subnormal intelligence" is, of course, not wholly satisfactory, for certifiable defectives are themselves subnormal. But the group of subnormals is generally recognised, and the term was originally used by Healy.[2]

Before dealing with the other varieties of mental abnormality which were found, it will be convenient to give an age-table for the whole series of cases.

	Indecent exposure.	Indecent assault.	Total.
Under 21 years	6	16	22
21–30 years	25	16	41
31–40	11	3	14
41–50	3	1	4
51–60	1	2	3
Over 60 years	4	12	16
	50	50	100

In considering this age-table, it must be kept in mind that, under ordinary circumstances, boys under the age of 16 years cannot be sent to prison. The only case below that age in my series was that of a mentally defective boy of 15 years, who was remanded to prison under Section 102 (3) of the Children Act, 1908. The number of cases in each age-group is too small to allow of any sweeping conclusions being drawn. But it would appear that there is a tendency for these offences to increase in number up to the age of 30 years, after which there is a fall, followed by a marked rise after the age of 60 years. And having regard to the comparatively small number of men living after 60 years, the figures are striking.

Senile Degeneration.

The cases placed under the head of "senile degeneration" form a sad group, with which it is not easy to deal. In these cases there was evidence that senile mental decay was occurring, but that this had not attained to a degree which justified certification under the Lunacy Acts. That the present legal criteria of "criminal responsibility" require reconsideration is now generally admitted. It is a question whether this particular class of case does not furnish as grave, or even graver reasons for such reconsideration as any other. The recent legal committee, presided over by Lord Justice Atkin, has recommended that the law should be altered, and that a person charged criminally with an offence should be regarded as "irresponsible for his act when the act is committed under an impulse which the prisoner was in substance deprived of any power to resist." Without entering into the extremely complicated questions raised by this proposed extension of the present rules of law, it may well be that many of these cases could be brought within the limits of the proposed new ruling. Several of these cases in my series were those of men of hitherto irreproachable life. Two of the cases were placed under the supervision of their friends, and one was sent to a nursing home. The others were sentenced to terms of imprisonment of varying length

because there seemed to be no other way of dealing with them. But it must, surely, be admitted that this is an irrational way to treat such cases, even bearing in mind the paramount necessity for the protection of society. Much has been made, in this connexion, of the influence of irritation caused by chronic enlargement of the prostate gland. There is no doubt that many of these cases present symptoms of prostatic enlargement. But we must, I think, be cautious in accepting this as the "cause" of the offence, for in most cases we find definite mental symptoms in addition to the prostatic enlargement. Nor is the improvement which has been claimed, in some cases, as occurring after surgical treatment entirely convincing. The mental effect of the operation must not be overlooked. Nor may we forget that the fact of the patient assenting to the operation is some evidence of "insight," on his part, into his condition, and of desire for a cure. Krafft-Ebing [3] has suggested that these sex offences, committed by elderly men, indicate weakened sexual potency. May not the explanation, at least in some cases, be that the offence is the result of a mental conflict between unconscious desire and conscious knowledge of diminished potency? In this connexion we must remember the marked tendency shown by elderly men to marry quite young girls. For a full discussion of the whole question see Bresler,[4] and for statistics see Aschaffenburg.[5]

The marital condition of the men was as follows: Disregarding the cases under 21 years of age, all except one of whom were unmarried, of the exposure cases 55 per cent. were single or widowed, 45 per cent. being married, while for the assault cases the percentages were 71 and 29 respectively.

Mental Conflict.

The cases assigned to mental conflict form the largest and the most controversial group. In 11 of these cases the court was found willing to accept this explanation of the offence, and to place the man on probation, with the condition in some instances that he should receive proper mental treatment. To what extent, and with what results this condition was actually complied with, I am unable to say. And this point is of great importance. For if, as I believe will be the case, these mental conflicts become generally recognised as the main causative factor in many instances of delinquency of all kinds, and not merely of sex offences, it follows that suitable provision, institutional or other, will have to be made for their proper treatment. It is suggested, not—as some appear to imagine—that these cases are to remain untreated, and the patients allowed to do whatever they please, but that the present method of treating them by punishment is altogether inadequate. I have included under this heading only those cases in which it appeared to me to be quite certain that a mental conflict was at the root of the trouble. These conflicts were of very varied character. Some were due to repression of early sex experiences or of sexual imagery. There were cases in married men in which the sex desire could not be gratified in the normal way because of objection on the part of, or separation from, the wife, accompanied by disinclination for extra-marital intercourse. And there were some cases among the younger unmarried men in which normal sex indulgence was prevented by ignorance, nervousness, or fear of consequences. I am not, of course, implying that unbridled or indiscriminate sex indulgence is to be advised in these, or in any other cases. The point is that in these cases there was failure to find satisfactory substitution.

The conflict cases were much more numerous among the younger men, 71 per cent. occurring in those under 30 years of age. This agrees with Healy's findings.[6] It is uncommon in my experience, as in his, to find evidence of mental conflict among older offenders, but the start of their delinquent careers may have been produced in this way. It may also be noted that the conflict cases were slightly more numerous among the exposure offenders. Investigation of a far larger number of cases is required on this point, but we might, perhaps, expect the findings of this present series to be confirmed. Indecent assault is a much more "understandable" offence, and that satisfaction may result therefrom is much more obvious. The offence may simply be a preliminary step to actual sex connexion. But the satisfaction derived from indecent exposure is far more difficult to comprehend. The patient himself often experiences this difficulty, and cannot explain why he committed the offence. This is the case with all offences due to mental conflict. There is often a peculiar absence of satisfaction resulting from the offence itself. The patient experiences a sense of impulse towards some action, a sense of tension, and the action results in relief of that tension. There is, to that extent, satisfaction, but there may be no more than that. It is an infantile type of reaction to endeavour to dispose of an idea by means of repression, and then to try to obtain some satisfaction for the instinctive desire which it connotes. It is an instance of the infantile character of the unconscious.

The high percentage of mental conflict cases in this series is confirmed by my studies of offenders of other kinds, as well as by the researches of other workers in this field. And it becomes clear that mental conflict is one of the most frequent causative factors in the production of delinquency. It is likely that further work will demonstrate that this is absolutely the most frequent factor. The implications involved in this finding open up a vast subject, which cannot be entered into here. But our entire conception of the cause of many offences, and of their rational treatment, will have to be radically altered. It may be true that some of these cases, for various reasons, are unsuitable for any form of treatment by mental analysis. On the other hand, many are most eminently suitable for this form of treatment.

The previous history of the cases was investigated as far as was possible. And the statements made, on this head, by the patients themselves were checked as far as possible. The absence of "field workers" was a great hindrance here, and this defect will have to be remedied in any future extension of this work. Friends and relations of the offenders were seen by me whenever such an arrangement could be made. Much useful information was obtained in this and in other ways. But this information does not lend itself to statistical presentation. The previous convictions of the offenders can, however, be given with a fair approach to accuracy. Of the exposure cases 14 (28 per cent.) had been previously convicted of similar offences, and 6 (12 per cent.) had been previously convicted of offences of other kinds. For the assault cases the figures were 11 (22 per cent.) and 9 (18 per cent.) respectively. That 25 per cent. of the whole series had been previously convicted of similar indecent offences is a very striking fact.

Necessity of Examination Before Conviction.

I am well aware that the whole number of cases is not large. I have had to choose between the intensive study of a small number of cases and the superficial examination of a larger number. In my view, the former of these two courses is the only one worth adopting. To assign some factor as a "cause" for delinquent actions, after a superficial inquiry, is a course which has been adopted far too often in the past. Many cases of other kinds have, of course, been examined during the period under review. The facts and figures of the present series are given rather as indications for the lines of future most necessary research than as a basis for any sweeping conclusions. But there is one inference which we may fairly draw. In only 17 per cent. of the cases in this series was the result of mental examination negative. And even among these negative cases there was evidence that one man had been previously certified as insane, in two cases chronic alcoholism was present, and one man was ultimately found to be suffering from a cerebral tumour. These facts surely

indicate the pre-eminent necessity for the fullest investigation of these and of other offenders. Such examination should precede conviction. This is the only logical procedure. And, further, the results obtained by examination before conviction are far more satisfactory than are those obtained by examination after conviction. The patient is at his best when he feels that he presents a problem which the examiner desires to solve. When conviction has taken place a new attitude of resentment is often set up, and this may persist for some time. I have dealt with this particular aspect of the matter more fully elsewhere.[7] Until mental examination has been made, a court is quite in the dark as regards the most important feature in the case. And it is much to be desired that certain kinds of offence, including all "sex" offences, should be investigated by an examiner possessed of knowledge and experience before they are finally adjudicated upon. We have now adopted the position that no person should be physically damaged by punishment, if such damage can be prevented. It would seem that this principle should apply to possible psychical damage. Yet there is no doubt that psychical damage is often caused to these subjects of mental conflict by imprisonment without proper mental treatment. The harm done by the indiscriminate serving out of sentences of imprisonment has been recognised by the Probation Act and by other legal enactments; there seems to be at the present day a marked tendency to make every effort to avoid sending any offender to prison. Indeed, it may be that harm is now done by placing some of these mental conflict cases on probation without any condition as to proper mental treatment. The whole question requires to be put on a sounder footing. And the intensive investigation of the individual offender is the key to the whole position. That the necessity of such investigation requires to be recognised by courts is shown by the fact that, of the 100 cases reviewed in this paper, no less than 15 were sentenced to imprisonment without any preliminary mental examination. These 15 cases included two of the insane men, all the six imbeciles, and four other mental defectives, and one case of subnormal intelligence.

This paper is published with the permission of the Prison Commissioners, but it must be understood that only my personal views are expressed therein.

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NOTES ON AN OUTBREAK OF EPIDEMIC ENCEPHALITIS WITH PAINFUL ABDOMINAL SPASM.

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THE constancy with which successive outbreaks of epidemic encephalitis have occurred at or about the same time in each year has been noted in all countries since its first appearance. It is just six years [1] since a small outbreak in this district ushered in the disease to this country, and true to its time, almost to a week, there is now a similar outbreak here rather more extensive in numbers. In this brief note I wish to call attention to certain features of this outbreak, which although containing nothing that has not been previously noted in other outbreaks in other parts, presents certain characteristics which have not been previously common here.

[1] THE LANCET, 1918, i., 568.

Nearly every outbreak differs to some extent from those preceding it in the same area, by the local predominance of some symptom or type. Thus, whilst among the present series there are classical cases of the oculo-lethargic and of the choreatic type, these do not form a large percentage of the whole. Most of the cases, on the other hand, show the following group of symptoms, one or more being particularly prominent in different cases.

1. Intractable initial insomnia, going on for many nights.

2. Delirium, in which throughout the whole night the business affairs of the day are repeated with merciless persistence (occupation-delirium). At times they become violent, but this is the exception, and does not, as a rule, persist.

3. Disorders of the respiratory mechanism. Attacks of dyspnœa with polypnœa, or irregular deep breathing. These occur mostly in the night and may continue during sleep. In some they have been present also during the day. They are quite unlike anything else, and in some cases have been the initial symptom.

4. Acute painful spasm of some muscle or group of muscles of the abdominal wall, the so-called abdominal myoclonus.

5. Ocular phenomena either in the form of loss of upward conjugate movement, with inability to raise the upper lids, or more general weakness of eye movement, and consequent disturbance of vision, the details of which it is difficult to ascertain. In some cases there is even a "visual apraxia." Nystagmus is common.

As stated above, marked lethargy has not been common. Fever is usually slight. A very foul tongue and obstinate constipation are usually present. It is, however, to the symptom of abdominal myoclonus that I desire to call particular attention. Unless its true nature is realised there is danger of it being mistaken for an abdominal emergency, which it may closely simulate. I have seen two cases, one in which it was thought to be an acute pleurisy, another renal colic. At onset it is the cause of very severe pain which recurs with every violent spasm of the muscles, and these may be firing off every second or at rather longer intervals. As time goes on they seem to cause less pain and indeed to go on without disturbing the patient at all. Why this is so I do not know, as the spasms seem as violent as before. Although any muscle may be involved, in all the cases I have seen the spasm has been either in the upper part of the rectus abdominis, either one or both sides, or in the left external oblique. The spasms recur at frequent intervals. They vary in depth, and in regularity. Tracings of them show some interesting features, but their investigation is not yet complete.

In the cases in which both the upper recti are involved the spasms may be, and often are, synchronous, but in one case they tend to alternate, first one side then the other contracting. That these cases, in which there is apparently nothing else than the painful abdominal myoclonus (the algo-myoclonus of Cruchet), are identical with other forms of the disease is shown by the series of cases here, for there has been every gradation from these to cases with slight other symptoms and finally to severe and even fatal cases showing lethargy ocular and other cranial nerve palsies, &c. As a matter of fact, almost every case in which this myoclonus is present will show on careful inquiry or full examination quite definite stigmata of the disease. You will find that there has been occupational delirium for a night or two, or something queer about the breathing, or a temporary complaint as to vision, or that there actually is some unsuspected disorder of eye movement in some direction, or unequal pupils or possibly a nystagmus.

A considerable number of cases of so-called epidemic hiccough has also occurred here recently, and one of the abdominal myoclonus cases was said to have had this at the onset, but I am not quite certain of this. Most of the hiccoughs clear up in three or four days, whereas the clonus may continue for several weeks.

THE SPEECH CLINIC.

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THE death of Prof. Hermann Gutzmann, of Berlin, affords an occasion to consider the department of medicine which he did so much to create. That the abnormalities of speech were of very great importance, not only for purposes of diagnosis but also as instruments for pathological research, had long been recognised by such men as Brücke, Kussmaul, and others, but down to about 20 years ago no one had devoted himself to speech pathology as his life work. Prof. Gutzmann was one of the first to do this. In Berlin he developed a well-equipped speech clinic and laboratory for studying speech abnormalities. For many years he edited the *Monatschrift für die gesammte Sprachheilkunde* which was later merged in *Vox*. He instructed large numbers of medical students to understand speech and to treat the various forms of speech defect. One of his pupils has established a similar laboratory in Vienna. Many medical men have studied the subject with a view to adding it to their regular work.

Outside Germany little has been done. Shortly before Gutzmann took up work at Berlin, I started a speech clinic at the Vanderbilt Clinic in New York city. For the last seven or eight years I have conducted a speech clinic at the West End Hospital for Nervous Diseases in London. Otherwise, as far as I can learn, nothing of the kind has been done in England.

Lack of Knowledge of Speech Phenomena in England.

The most striking fact of the situation in England is the complete ignorance of speech phenomena, not only among practitioners but also among neurologists and laryngologists. For more than fifteen years I have been in constant association with neurologists and have never met one who could diagnose the dysarthrias correctly. Any muddled kind of speech is said to be a dysarthria. The most frequent dysarthria of all, that of the larynx, is never recognised. The most prominent feature of all dysarthrias—the effort to overcome the defective action of the speech mechanism—has remained absolutely unknown. I have often pointed out that the most prominent feature of speech in a case of disseminated sclerosis is not the ataxia, but an effort to overcome the ataxia—that is, what may be called "anataxia." I can remember the surprise and pleasure of a distinguished neurologist when I compared an inscription of a case of Landouzy-Dejerine with normal ones, and showed how the former was pathological just because it was too perfect. In a case of Friedreich's ataxia this over-perfection in enunciation was likewise found; the disease made itself evident only in the longer time required. Of the speech signs in more central troubles the ignorance is complete. Every medical student knows that to stumble over "third riding artillery brigade" is a sign of general paralysis, but not even the best neurologist has the faintest notion of what the patient really does when he stumbles or why he does it. In the earlier cases the neurologist regularly misses the speech defect because he does not know what to look for. Other forms of speech defect remain quite unknown. The epileptic voice is just as characteristic and clear a sign as any dysarthria, and the ear can be trained to detect it. Year after year I have sat in nerve clinics and diagnosed the cases as epilepsy or not epilepsy by the manner in which the patient begins to speak. Although a trained ear never makes a mistake, the neurologists are quite ignorant of the existence of this sign.

The laryngologist contents himself with what he can see. He considers that when he has treated any organic trouble or has recommended an elocutionist his duty is over. He does not bother himself about the inner nature of the defect or its cure. Owing to their lack of information medical men in general never make any attempt to give an accurate speech diagnosis. When confronted with one of the special speech defects, all they can do is to state that the case is hopeless, or will cure itself, or had better be taken to an elocutionist.

Function and Equipment of the Clinic.

The solution of the difficulty lies in the establishment of speech clinics for diagnosis, research, and instruction. Such a clinic can justify its existence in the first place by what it can do in the way of diagnosis. It can—by the method of making speech inscriptions, and studying them under the microscope—furnish accurate diagnoses of general paralysis and disseminated sclerosis at a stage so early that no speech defect can be heard. Let it be remembered that general paralysis has been cured if treated by malaria at an early date. Let the possibility be remembered of mistakes between early disseminated sclerosis and hysteria, so that we may be careful not to send a case of the former to a psycho-analyst. Let it also be remembered that early cases of disseminated sclerosis can be cured by the Wagner-Jauregg method. The inscriptions of adiadokokinesis and other manifestations of dysmetria are so easy to make, and so striking, that they are useful in telling when the cerebellum is diseased or involved in a tumour.

Equally important is the service of a speech clinic for the purposes of research. Inscriptions of epileptics always show a peculiarity that has never been found in any other disease. They furnish a proof of the view that idiopathic epilepsy is not a disease of the cortex, but a special condition of the patient's character.

A third claim for the speech clinic is its usefulness for treatment. Over 600 cases of laryngectomy have been taught to use ructus speech at the Phonetic Laboratory in Vienna; many of them have been restored completely to work even when telephoning is involved—that is, they were taught to speak audibly by air from the stomach, although they had no larynx and breathed through a cannula. In the clinics at Berlin and Vienna the treatment for the various forms of aphonia has reached a high degree of efficiency. I have found that, in combination with other methods, the training of epileptics to eliminate their peculiar voice is followed by improvement in the general condition. The treatment of stuttering on the basis of clinical researches would put an end to the present methods of the elocutionists.

A further claim is that of usefulness for instruction. Speech is the most complicated and delicate manner in which mind and nerves express themselves. It contains more kinds of diagnostic information than many another manifestation, and its pathology, if properly learned, is as useful to the practitioner as a urinary analysis.

One obstacle to the establishment of speech clinics has been the difficulty in obtaining the apparatus required. To various inquirers in the past I have been obliged to reply that the only recording drums of sufficient accuracy were an expensive one made in Leipzig and a cheaper one that could be made to order in America. The speech recorders could be obtained only in Paris. The highly important laryngostroboscope could not be obtained anywhere. This obstacle has now been completely overcome by what might be called the fortune of war. Under the new government the Ministry of War of Austria teaches every soldier a trade. One department of the instruction is that of making fine apparatus. All the apparatus for speech work is now duplicated with a fineness and precision equal to and often better than that obtainable by the best German and French mechanicians. The crux of the matter lies in the fact that it is forbidden to charge for the labour or to make a profit. The only charge is for the cost of the raw metal used. A complete speech laboratory can be equipped for a sum so modest that even the poorest hospital need not think twice about it.

Clinical and Laboratory Notes.

UNCOMMON CONDITIONS ASSOCIATED WITH LIVER LESIONS.

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THE following cases seem worth recording from both the clinical and the pathological standpoint, as the clinical course in each case was unusual, and the post-mortem findings, especially in the liver, uncommon.

CASE 1.—A girl, aged 8, admitted to the Bagthorpe Infirmary on Nov. 9th, 1923, suffering from extreme hoarseness and sore-throat. Temperature 99° F. She was put on salicylates, and the temperature dropped. On the 16th the temperature went up to 102°. Examination only revealed a faint apical systolic bruit, and a rather sharp pulmonic sound. Next day the child was intensely ill—ashen, drawn face, sordes on lips, and tongue like leather—not at all unlike the extreme toxic appearance of a patient dying of peritonitis. The temperature ran an intermittent course, reaching 103° on a few occasions. Examination revealed nothing further until the 20th, when signs of consolidation appeared in the left lung. The child died on the 25th.

Post-Mortem Examination.—Extensive pleural adhesions at left base, which was pneumonic. Aortic and mitral valves intensely inflamed. Neither valve was ulcerated, but when opened out the cusps formed a bright crimson line across the ventricle. Tricuspid valve also inflamed in parts, but not so extensively. Abdomen distended and full of fluid of ordinary ascitic type. Liver was greatly enlarged and typically "hobnailed." Spleen enlarged, and pancreas felt abnormally hard. Sections of liver showed characteristic unilobular cirrhosis, and sections of pancreas showed extensive fibrosis.

CASE 2.—Male, aged 22, admitted on Nov. 23rd, 1923, with a diagnosis of influenza, having been ill a fortnight. He gave a history of having had several attacks of "boils," but on admission showed no evidence of a current attack. His temperature on admission was 100·4° F., and except for severe pyorrhœa examination revealed only some impairment of resonance and breath sounds on right side of thorax posteriorly. Patient was unusually drowsy, and as his chart suggested in the course of a few days a septicæmia, a blood culture was performed. This gave a pure growth of *Staphylococcus aureus*. On the 28th exploration of the right base gave a slightly hazy fluid mixed with much blood. On this day, also, a septic rash appeared on the arms, and the patient was incontinent at times. On Dec. 3rd exploration at a lower level than previously discovered abundant pus. Resection of a rib had an unexpected sequel—the pleural cavity contained no pus, and an abscess of the lung was regarded as the site of the pus. Next morning the patient had a right parotitis and died that day.

Post-Mortem Examination.—Bases of both lungs pneumonic, with marked purulent pleurisy. Heart and aorta small, but no valvular lesion in heart. A large abscess *in* the right lobe of the liver in its upper aspect almost on the point of rupture. The abscess appeared localised and apart from it the liver did not present a pyæmic appearance. The spleen was enlarged and the kidneys congested.

Remarks.

Case 1 is chiefly of pathological interest in view of the intense widespread inflammation of the valves of the heart and the extreme cirrhosis of the liver in a child of 8. How far this cirrhosis contributed to the extremely toxic state of the child invites speculation.

In Case 2 arises the question of the origin of the septicæmia. The patient had never been abroad, and had no history of dysentery. The extreme pyorrhœa, or the lighting-up of a dormant focus left after one of the attacks of "boils," both seem possibilities. (A similar fatal septicæmia occurred recently in a boy aged 18 without any obvious focus, but six months previously the boy had a severe septic finger which apparently healed completely.) As regards locating the pus, if the abscess had been in the lung, the latter would probably have been adherent to the parietal pleura, while the empty thorax, the height of the diaphragm, and its tenseness, should have suggested a subdiaphragmatic source.

A CASE OF INTRAPERITONEAL OVARIAN PREGNANCY WITH A FULL-TERM CHILD.

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(From the King Chulalongkorn Memorial Hospital, Bangkok, Siam.)

THIS case is recorded as intraperitoneal pregnancy with a full-term and living child is unusual.

A married woman, aged 37, was admitted into the maternity ward of the hospital, under the care of Phya Damrong-baedyakun, on August 9th, 1923, complaining of abdominal pain and bleeding from the vagina.

History of Present Condition.—In December, 1922, patient missed her period, but in January the flow appeared again and at the expected time, lasting seven days. It was, however, offensive. Since then there had been complete amenorrhœa. At about this time she suffered somewhat from morning vomiting and frequency of micturition. No change in the breasts was noticed by patient until a few months ago, when they seemed to be distended and a little yellowish secretion could be squeezed out. The child was first felt to move about the fifth or sixth month. Two days before admission patient bled from the vagina. A doctor was called in, who diagnosed the case as antepartum hæmorrhage, and sent her to hospital.

Past History.—Patient had been in good health. Her periods had been regular, being present at intervals of 28–30 days, lasting four to seven days. There had never been any leucorrhœa. Patient had suffered from indigestion for the last four to five months.

Family History.—She had had five pregnancies, of which there were three children and two miscarriages (the second and fifth, each of about seven to eight months). The latter miscarriage happened in 1916. In 1919 patient, who had lived with her husband since marriage, obtained a divorce and married another man. The present pregnancy was the first after the second marriage. Her second husband is 24 years of age.

Condition on Admission.—Patient, who appeared quite calm, was a thin and somewhat pale-looking woman. The temperature was 98° F. and the pulse-rate 110. The pupils reacted well to light and accommodation. The conjunctivæ were slightly pale. The breath was foul, though the teeth were fairly good. There were no enlarged glands felt in the neck. Nothing abnormal was found in the lungs or heart. An oval lump was seen in the abdomen, which reached from the symphysis pubis to about 2 inches above the level of the umbilicus. Its long axis was from the left below to the right above and about 45° to the vertical. Knobs were seen on the lump. The abdominal wall was thin, and the lump was recognised as a fœtus lying in the left occipito-anterior position. A limb could be picked up between the fingers when the fœtus made a convulsive movement. The fœtal heart-sound was heard near the umbilicus. The vaginal orifice was covered with varicose veins. The speculum was carefully inserted, but one of these bled. It was immediately ligatured. The cervix was found enlarged, œdematous, rather soft, and mauve-blue in colour. When it was moved there was no transmission to the lump in the abdomen. On withdrawing the examining finger a somewhat profuse bleeding from within the cervix occurred, the blood being bright red.

Diagnosis.—As the abdominal wall was thin and the fœtal parts could be so easily palpated, and no uterine contraction was obtained, a diagnosis of extra-uterine pregnancy was made. The bleeding from within the cervix, however, could not be explained; but in a former case of extra-uterine pregnancy which was admitted into hospital not more than ten days previously—a remarkable coincidence—and had a fatal termination, there was also bleeding from within the cervix.

Treatment.—As the bleeding stopped of itself, and as the patient appeared very weak, operation was postponed and a careful watch was kept over her. On the 17th the child was kicking continually, causing a faint feeling with severe abdominal pain; and blood was observed to flow from the cervix more profusely than before. The uterus and the vagina were thereupon packed with strips of gauze, and an immediate operation was decided upon.

Operation.—The patient was placed in the dorsal position. The skin was cleaned with absolute alcohol and swabbed with iodine. An incision was made in the median line extending from the umbilicus to the symphysis pubis. Skin and the fasciæ were divided until the peritoneum was seen. This was picked up and carefully divided, when the breech of the fœtus became exposed. The right hand was introduced into the abdominal cavity, and the child was seized by the legs and delivered. It was quite blue. The

mouth was swabbed with gauze and the umbilical cord ligatured and divided.

On examination the placenta was felt adherent to the under surface of the liver and the right side of the abdominal wall. It had a downward process which seemed to envelop the right ovary and the cæcum. The uterus was about the size of a three months pregnancy, and was somewhat flabby. The uterine tubes and the left ovary looked normal. The infundibulum of the right tube was implicated in the placental process. The placenta was left in situ for fear of uncontrollable bleeding if removed. The abdominal wall was closed in separate layers. The patient was under chloroform in five minutes, and the child was delivered five minutes later. The whole operation took 25 minutes. When the abdominal cavity was opened, a little clear fluid was observed. No membranes were found, but when the child was delivered a portion of the membranes was seen capping its head tightly.

The Child.—The child remained blue and refused to cry, breathing weakly for fully five minutes, during which it was placed in a warm bath and slapped, and artificial respiration was applied. Though it could breathe better, it was still somewhat blue for three days after. No congenital heart disease was detected. The child was a full-term and weighed 2260 g., or 5 lb. (The average weight for a Siamese new-born is 3000 g., or 6½ lb.)

Later Notes.—At the end of 24 hours the vaginal plugging was removed; the bleeding had stopped. Much anxiety for the child was felt on account of the cyanosis. Small quantities of warm water were given during the first day. On the second day it was put to the breasts of a woman who had just given birth to a child in the same ward, and who had enough milk for two. The mother had been feeling very weak since the operation. Her breasts contained little milk, which was withdrawn with a breast-pump, as it caused an uneasy feeling in the organs. Some anxiety was still felt as to what might happen to the placenta. On the 24th the wound had healed. The temperature and pulse had been about normal. Patient felt somewhat weak and appeared listless. On the 31st, till which day the patient had been feeling weaker and weaker, the temperature went up to 103° and the pulse-rate to 90. On Sept. 9th the temperature, which had come down somewhat, went up again to 104°. The patient became very weak, and died at 1.30 A.M.

The child (a girl) has been and is progressing satisfactorily. Its weight has been increasing as follows:—Fed on human milk: August 24th, 2260 g.; Sept. 1st, 2440 g.; 7th, 2540 g. Fed on bovine milk: Oct. 1st, 3250 g.; 8th, 3410 g.; 15th, 3470 g.; 22nd, 3750 g.

Post-mortem Examination.—The heart, liver, spleen, and kidneys were soft and pale-looking. In fact there was general anæmia. To the under surface of the abdominal wound were adherent the great omentum and anterior portion of the placenta. The placenta itself was roundish in shape, lobulated, and contained in a capsule, looking very much like a multilocular ovarian cyst. It was attached to the end of the right uterine tube by a stout stalk, and the right ovary could not be found. The left tube and ovary were natural in appearance. The uterus was about the size of the fist. The placenta was anchored by adhesions to the omentum and bowels which were easily stripped off from the capsule, when the mass became free save at its lower attachment to the tube. The placenta did not look infected, but the general peritoneum was dull-looking, congested in a few places, and appeared thickened. Section of the placenta showed presence of lymphocytes in the region beneath the capsule.

Death was presumed due to lowering of body resistance following chronic peritonitis and general anæmia.

THE LATE DR. W. B. BETENSON.—The death occurred at Newhaven on March 8th, after a long illness, of Dr. William Betenson Betenson. A native of Suffolk, he studied medicine at St. Bartholomew's Hospital, and in 1888 took the L.S.A. diploma and became L.R.C.P. Lond. and M.R.C.S. Eng. For some time he was house surgeon at All Hallows County Hospital, Ditchingham, and in 1901 started practice at Newhaven. He became attached to the local R.N.V.R. in 1904, and during the late war he had a distinguished record. He went to the Dardanelles as surgeon-commander on H.M.S. *Bacchante* (1914–16) and later served on H.M.S. *Powerful* at Devonport. Afterwards he served with the R.N.V.R. at Newhaven. Dr. Betenson was popular in the service and also as a private practitioner, and despite an extensive practice he found time to identify himself actively with public affairs. Before the war he was a member of the Newhaven Urban Council and for a year held the position of chairman with a seat on the magisterial bench. For many years he was medical superintendent at the Union Infirmary, Newhaven.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

CLINICAL RESULTS OF DEEP X RAY THERAPY.

A MEETING of this section was held on March 21st, when a discussion was held on the Clinical Results of Deep X Ray Therapy. Dr. WALTER J. TURRELL, the President of the section, was in the chair.

Dr. WILLIAM MITCHELL (Bradford), in opening the debate, explained that his remarks would be based on 20 years of experience at Bradford in radiotherapy, and that his technique was that recently described by Vince in his book. As a result of much unwise comment in the press, a much greater demand for X ray treatment had been made than was justifiable, many false hopes were raised, and those who had been feeling their way on the subject had found their hands forced, for it came to be regarded as almost a crime to refuse to treat a case in this way, however hopeless it might be judged. Of 133 malignant growths treated 30 were carcinoma of the breast, 28 epithelioma of jaws, tongue, and larynx, 1 of forehead, 8 cancer of the pelvic colon and rectum, 7 of cervical glands, 2 of superior maxilla, 4 sarcomata, 2 carcinoma of the body of the uterus, 20 of the cervix uteri, 2 of the pancreas, 2 sarcoma of skull, 1 chondro-sarcoma of pelvis, 1 epithelioma of ear, 2 carcinoma of kidney. Stomach, bladder, and rectal cases, 1 osteo-sarcoma of clavicle, and 1 myeloid sarcoma of the head of the femur, sarcoma of buttock and lympho-sarcoma of neck. Hodgkin's disease, uterine fibroids, carcinoma of thyroid, splenic leukæmia, and some minor conditions were also treated. Forty-eight of the 133 cases were hopeless before treatment was commenced, and 46 of the cases were post-operative recurrences. At the end of a year 41 had ceased attending before completing their course, many because their doctor advised them that the treatment was probably doing them more harm than good, some because they felt the treatment was upsetting them. Of two cases of cancer of the cervix uteri, both of which he at one time thought were cured, one had a severe recurrence and refused to have further treatment. In two cases of carcinoma of the pelvic colon who had had colotomy performed, the result of the treatment seemed good, and one was still living, though with a fæcal fistula. One case of carcinoma of the bladder, in which that viscus had been opened and cauterised, he had treated six times with a 20 per cent. dose, at the end of which course the man was in good condition, nothing could be felt per rectum, and urine was passed easily. After each treatment the urine remained clear for three months, but then blood reappeared in it. The four breast cases appeared to do very well. A case of lympho-sarcoma of the neck at one time seemed cured, but there was a recurrence, and death took place from pulmonary metastasis. A myeloid sarcoma of the humerus, in a girl aged 6, was cured by the treatment; he exhibited skiagrams showing the regeneration of bone which had taken place. Tuberculous dactylitis did well, as indeed it did in former days, with the old treatment. It was, he thought, impossible to promise cure of malignant disease by X ray therapy, chiefly because metastasis was an unknown quantity before treatment was commenced. If a case were treated while in a hectic condition, it was probably made worse than before. The most favourable cases were those with a good blood count and high hæmoglobin index. There was a difficulty in regard to beds in hospitals for the treatment of these cases, hence in too many cases these patients, after each séance, had to return to their squalid and insanitary homes, a fact which seriously militated against good results. Practically all cases, excepting the hectic ones, received temporary benefit from the treatment, and expressed themselves as much fitter in general health.

The Dual Effect on Patient and Growth.

MR. SAMPSON HANDLEY said the time had passed when surgery alone could claim to deal with malignant disease; in nearly all cases the help of the radiologist was necessary. Yet he was not clear that what was known as deep X ray therapy was the sort of help the surgeon would ask. The effects of deep X rays on patients with malignant disease should be placed under two headings: (1) the effects on the patient; (2) the effect on the growth. The former still stood in need of investigations by the biochemist, and those made at Middlesex Hospital by Dr. E. C. Dodds and Dr. J. H. D. Webster [1] deserved careful consideration. The former had thoroughly investigated a few cases, rather than more cursorily examining a large number, an intensive method of study which the speaker commended. These observers had found that while irradiation of the head, neck, and thorax had little effect on the urine, irradiation of the abdomen profoundly modified the urine, producing an immediate large drop in its amount and a variation in its essential constituents. They attributed this to a temporary inhibition of the functions of the principal abdominal glands, such as liver, pancreas, and kidneys. When the abdomen was irradiated there was a marked fall in the blood-urea content. Patients subjected to heavy X ray doses, especially applied abdominally, suffered from profound asthenia and loss of vitality—i.e., to a degree greater than could be accounted for by the disease for which they were treated; in this X rays afforded a striking contrast to the results of treatment by radium, which appeared to have a stimulating action, giving the patient a sense of increased well-being. Even sufferers from inoperable malignant disease had told him, when being treated by radium, that they had never felt so well in their lives. The effects of deep X ray therapy in amounts necessary for the surface treatment of deep-seated tumours were so marked that in such amounts the use of the rays was undesirable and deleterious. As to the effects of irradiation on the tumour itself, in certain cases there was undoubted benefit, while in others, actual stimulation of the growth took place. Mr. Handley proceeded to describe some cases. In the case of three patients who were subjected to deep X ray therapy, within a short time of the commencement of the treatment, new superficial metastases developed within the area treated. One was a breast carcinoma with recurrent nodules. Deep therapy had been carried out for the nodules, but fresh ones appeared there. Another was a carcinoma of the neck, with a recurrent mass just below the jaw secondary to carcinoma of the larynx, and shortly after deep therapy had been applied to the neck, the scar was a mass of secondary nodules along its length. In the third case the speaker excised part of the stomach for gastric carcinoma. Deep therapy was applied prophylactically, because he felt his operation must have been an incomplete one. Within two months of the treatment having been commenced, masses could be felt deep down in the abdomen. In one case of retro-peritoneal carcinoma, the primary growth probably being in the pancreas, for a mass could be felt there, enlarged glands existed in the right iliac fossa. That was in September, 1922. He thought the patient's life would be about three months. Dr. Douglas Webster applied deep therapy, after which the glands in the right iliac fossa disappeared, the patient seemed much better, and began to get about again. But the mass above began to grow again, and death took place two months ago. In that case he believed the deep therapy prolonged life about a year. For a man with carcinoma of the prostate, Mr. Handley buried radium into the lateral aspect of the prostate through punctures in the perineum. Improvement followed this, but he still had a mass in the right vesico-sacral fold, palpable per rectum, and he developed some glands in the right iliac fossa. After this one radium application, Dr. Webster treated the patient by deep X ray therapy, having begun it in February, 1922. If the case had been left the patient would probably have been dead by now, but he was still going on, all the glands in the left iliac fossa had disappeared, and the former œdema of the left leg had now gone. An opinion on the efficacy of the treatment was only possible after a long period of observation of cases. The technique was still fluid. His general view was that a medium must be observed between an X ray dosage which was inadequate to act on the growth and that which was harmful to the patient, and he did not think that balance had yet been effectively struck. The use of buried radium, in suitable cases where the area to be dealt with was small, possessed great advantages over deep X ray therapy, in that, with the radium, application of a maximum amount of irradiation of the growth could co-exist with a minimal irradiation of the tissues generally. In deep X ray therapy, however, irradiation of the tissues generally was hard to avoid, and was usually deleterious in its effects.

[1] THE LANCET, March 15th, 1924, p. 533.

Favourable and Unfavourable Conditions.

Dr. G. COOPER (Leeds) spoke from an experience of 400 cases of all varieties of malignancy. In most of the cases in which X ray therapy was applied there was a marked improvement in general health and an increase in weight shortly after the commencement of the treatment; it seemed as if the growth had been temporarily checked in the intensity of its malignancy. Pari passu with this there seemed to be a staying of toxic action. A decline in general health seemed to be associated with a return of activity of the growth. There was in many cases a cessation of discharge and relief of pain following the treatment, and, particularly when hard rays were used, a formation of fibrous tissue, the latter being probably an important factor in limiting the spread of the disease. Healing of rodent ulcer coincided with the formation of a dense layer of scar tissue, which cut off the normal from the malignant cells. Among the factors influencing the degree of response to the treatment were the amount of metastasis, the situation of the growth, the condition of the patient, especially the blood condition, the nature of the neoplasm, and the amount of irradiation administered. His best results had been obtained in genito-urinary conditions and pelvic conditions generally, but cancer of the cervix had shown a tendency to relapse, after the first improvement which practically always took place. By means of this therapy many cases adjudged inoperable had been rendered operable. There were also encouraging results in cancer of the rectum; pain was controlled, and the size of the growth reduced. Except in one case (in which the radiation was given at the time of operation) he had found the treatment in cancer of the stomach very unsatisfactory; nor had there been a favourable response in cancer of the tongue. A much more favourable report could be made concerning the treatment of primary glandular enlargements. In cancer of the parotid and thyroid glands, he had had good results at first, but nearly every such case subsequently developed metastases. The urgent dyspnœa of malignant disease of the mediastinum was often relieved by the treatment, but relapse occurred in three or four months. In spleno-medullary leucocythæmia an enormous reduction in the size of the spleen was effected in two or three weeks. Since the introduction of deep therapy more advanced and definitely hopeless cases were brought for treatment; it offered the only treatment likely to bring relief, and it could be said that more had been done for malignant disease by it than had hitherto been achieved outside the domain of surgery.

The Response of the Body Tissues and Fluids to Radiation.

Dr. ROBERT KNOX reminded the meeting that deep X ray therapy was not by any means a new departure, and it did not originate at Erlangen; in this country it had been steadily developed along sound lines. It was assumed that a particular lesion of the skin stood

a certain dosage, and that if there were a deeper-seated lesion it would respond to a similar dose. Deep therapy was based upon that; it was a logical extension of surface therapy, and was a question of wave-length. The points he wished to make were largely based upon Mr. Sampson Handley's work on the natural process of cure in cancer embodied in his book on cancer of the breast. It was necessary to supplement nature's efforts at cure; instead of depressing the tissues, efforts should be made to enable them to overcome the disease. In many cases that was what the radiologist did. In treating blood conditions in this way it was found that the blood cells responded in various ways to irradiation, and one of the lines of inquiry should be concerning the alterations in blood, blood serum, and the various biochemical processes. The work of Dodds and Webster was very fine in this respect, and if pursued would take the profession a long way in a rational therapy, and probably standardise the technique. The response of enlarged lymphatic glands to irradiation he had found to be remarkably rapid; not so rapid in lymphadenoma, less rapid still in lympho-sarcoma (and a greater tendency to recurrence). In sarcoma the reaction was not so certain, and in carcinoma there was an uncertain reaction. Dr. Knox then referred in detail to a number of cases and projected slides of them on to the screen. One of the most remarkable was that of a man who six years ago had a testicle removed for a carcinomatous condition. He had fairly frequent doses of X rays for two years. He then came with a large mass in his abdomen, which was regarded as malignant. A fairly heavy dosage was applied, and it disappeared in a remarkable manner. Early last year he came with a mass of glands in the supra-clavicular region, and had pleural effusion at the left base and a very large mediastinal tumour. Penetrating rays in considerable dosage were administered, and the left pleural effusion cleared up. The tumour was much reduced in size, but there was later effusion at the right base. In the course of time the right-sided effusion cleared up, and at present he was carrying on his duties (those of a clergyman). Dr. Knox expressed himself as a supporter of the idea that rays of lesser potency than those directed at the original growth had a stimulant action on secondaries which such rays reached, and he quoted a case supporting that view.

The Case for the Full Single Dose.

DR. REGINALD MORTON gave some general impressions which he had formed as a result of his clinical experience. The great advantage of this modern development of X ray treatment was that it enabled one to treat centrally situated lesions with greater efficiency than superficial ones. As to the relative advantages of single and of multiple sittings, there was much to be said on both sides. The idea of the single full dose was to avoid stimulating a growth to increased activity; now and again there were cases whose increased activity could not be accounted for on any other supposition. These, however, were but a very small percentage of the whole. There was a smaller margin of error in dosage in the administration of a single dose. Even in deplorable cases giving but little hope, if X ray treatment were clamoured for it should be given. He did not think the percentage of successes from X ray treatment by modern methods was greater then formerly. In this country it was still the custom to send to the radiologist only the practically incurable cases. Hard tubes and heavy filtrations formed a homogenous means of using the rays, but they did not appear to have any more specific action on living cells. A series of cases of rodent ulcer which he had treated by the Erlangen method gave no better results than a similar series dealt with by the older technique. Some of his best results had been in pelvic conditions. Cases involving the air-passages and the neck generally were unfavourable; cartilage did not respond well to the rays. Some cases of cancer of the rectum responded very well, and prostatic involvement yielded successful results in a high percentage, especially simple enlargement of that gland as distinct from malignant conditions. In none of his cases had irradiation brought about any serious fall in essential blood cells, and he thought too much stress was usually laid on this danger. In this connexion, length of exposure was an important factor.

DR. CURTIS WEBB spoke of the favourable results he had secured by the Erlangen method during 18 months, and related a number of cases. He favoured at present the single massive dose, in contrast to the divided dosage as mostly practised in France, chiefly because by the latter one could not be certain that the full intensity of irradiation reached the deeply situated disease.

The Combination of X Rays and Radium.

DR. N. S. FINZI spoke of the good results achieved by deep X ray therapy a number of years ago, and instanced a case of his own, that of a boy with retro-peritoneal lympho-sarcoma, whom he treated in 1911 with hard rays filtered through 2 mm. aluminium. He was cured and was seen in good health last year. He was decidedly of the opinion that modern methods were superior to the old, and that they gave better results. The feeling was too prevalent that either X rays or radium must be used; often the best results were secured by a combination of the two. The primary growth was often best treated by radium, while the region permeated by the malignant cells could be irradiated most effectually by X rays. Also splitting the radium into two foci was valuable. Radium therapy was advancing in parallel with X rays. He agreed that the changes produced in the blood by radio-therapy had been exaggerated. Septic cases did not do so well as others, by either method. When breast cases were complicated by mediastinal involvement he regarded the outlook as bad. Giving the patient chloratone before the irradiation helped to ward off sickness.

DR. LOUISA MARTINDALE related her experiences based upon 160 cases. She had seen very little sickness, a fact she ascribed largely to her preparation of the patient—i.e., as for an abdominal operation. Of 50 female castration cases, sickness occurred in only 2. Severe menorrhagia yielded well to X rays.

DR. J. H. D. WEBSTER advocated a close study by radiologists of pathological processes. The best prospect from X ray and radium treatment was produced by causing a powerful caustic effect on the malignant cells, and this was effectively brought about by multiple small radium tubes. In some classes of cases the right course was to try and restrain the growth by building up the patient's health and powers of resistance. He agreed that small doses of the rays resulted in a stimulation of the new growth. There was always the danger that the area harbouring the minute seeds of the disease was not coming under the influence of the treatment. More investigation should follow the important discovery that irradiation caused the disappearance of certain types of rare blood cells.

The PRESIDENT thought a third treatment which wat worthy of consideration was diathermy. He did nos support the treatment by deep X rays of fibroids at the menopause, reminding members of the importance of the endocrine functions of the sexual organs, which were not yet fully understood. Small repeated doses seemed the best course, as being calculated to injure as little as possible the endocrine activities.

IRISH MEDICAL SCHOOLS AND GRADUATES ASSOCIATION.—The annual meeting and St. Patrick's Day Dinner of the Association was held at the Hotel Cecil, London, on March 17th. Dr. W. J. Corbett, the President, was in the chair, and the speakers included Lord Shaw and Senator Marconi. About 120 members and guests were present, among whom were Sir William Taylor, Dr. William Douglas, and Dr. Michael Bulger, past presidents of the Association.

MEDICO-LEGAL SOCIETY.

SUDDEN DEATH BY INHIBITION.

A MEETING of this Society was held at 11, Chandos-street on March 18th. In the absence of the President, Mr. W. WILLIAMS was in the chair.

DR. PERCY B. SPURGIN introduced a discussion on Cases of Sudden Death by Inhibition, and their Medico-Legal Bearings, by telling the story of a tragedy which occurred on Oct. 11th, 1923. On that day, a day of intermingled sunshine and showers, James Murphy, a healthy and powerfully built young man of 21, took his dog out for exercise in Regent's Park. A shower drove him to take shelter beneath some trees under which Alfred Muchmore and a friend were kicking a football. Murphy's dog annoyed Muchmore and his friend by chasing the football and caused the friend to shout gruffly to Murphy to call off his dog. A few angry words ensued and then Murphy came over to the two friends and knocked down Muchmore, a much smaller man than himself, by a blow on the jaw which cut his lower lip. Muchmore and Murphy then fought until some spectators warned them of the approach of the park keepers, upon which they separated, but only to meet once more a few minutes later in another and more deserted part of the park and resume the fight. On this occasion Muchmore "knocked out" Murphy and left him lying on the ground, as he imagined and remarked to his friend, in a condition of being "winded." When he read later in the evening papers that Murphy had been found dead in Regent's Park he immediately reported at a police station and gave himself up. Dr. Spurgin was called upon by the coroner to perform a post-mortem examination three days later. Externally there were bruises on the forehead, on the left supraclavicular region, and on the thorax. Internally no abnormality was discovered other than in the heart. Both ventricles and the left auricle were so firmly contracted as to be quite empty of blood and the heart muscle itself was pale. He was driven to conclude that death was due to cardiac inhibition from stimulation of the vagus by a blow on the left side of the neck. The coroner accepted this view. Dr. Spurgin added that at the subsequent trial of Muchmore at the Old Bailey on a charge of manslaughter he was found guilty and sentenced to four days' imprisonment, which was equivalent to his immediate release.

Two other cases of death from a similar cause could be added. One, reported in the *Practitioner* of January, 1924, was that of a man of 52 who died of syncope while his wife was buttoning on his collar and thus causing pressure on the neck. In this case similar conditions were found in the heart at the post-mortem examination. Another case of death probably from the same cause was that of the English boxer Evans, who died during a contest in Holland.

SIR BERNARD SPILSBURY recounted some cases in which the cause of death was slightly different from that given by Dr. Spurgin. The first case was that of a female child, 3 years of age, who while taking a meal gave a slight cough and then fell back in her chair and gave no further sign of life. A doctor who arrived in about 10 minutes pronounced the child to be dead. This doctor was called upon by the coroner to perform a post-mortem examination, and after doing so with some reluctance, reported that he could find no cause of death. Sir Bernard Spilsbury was then called upon to make a second examination. The only striking abnormalities were the unusual lividity of the post-mortem staining, the dilatation of the heart cavities, and the large size of the brain and thinness of the skull as if from stretching. The heart muscle was pale in colour, but on microscopic examination proved to be healthy. The air-passages had been opened at the previous examination when they were found to be free of all foreign matter. His view was that death was due to a crumb having entered the larynx and caused a "reversed reflex action" which stopped all the vital functions and more especially that of respiration. The crumb had been expelled by the cough so that it was not found in the larynx after death. Many areas of the body were known stimulation of which might cause sudden death; these included the back of the nasal passages, the larynx, the upper abdomen (two cases of sudden death from a blow on the upper abdomen were reported by Sir Astley Cooper), the lower abdomen, and the genital organs. An illustrative case was that of a man of 45, who returned to his home drunk. Knowing him to be very violent in his cups all the other inhabitants of the house fled on his approach. On their return an hour later he was found dead lying head downwards on the stairs. The speaker had performed the post-mortem examination, and though he found disease in various organs was unable to account for death until he found a large bruise in the body and head of the pancreas which suggested a blow on the upper abdomen. It was then found that one of the treads of the stairs was broken, and it was surmised that the breaking of this tread had caused the man to fall heavily upon a pillar of the banisters and thus receive a blow upon the upper abdomen which caused sudden death by inhibition. In another case a boy received a blow on the pit of the stomach while fighting and fell back apparently dead; a doctor who was called found that life was extinct when he arrived. Here again the skull was thin and the brain, and more especially the cerebellum, unusually large; it seemed as if the large brain had stretched the skull. Although some thickening of the mitral valve was found the cause of death was only traced when a large bruise was found in the diaphragm in the region of the pit of the stomach. Death was, in his opinion, due to "inhibition."

All resting muscle was normally in a state of tone, but when one set of muscles contracted in obedience to a nervous impulse the opposing muscles fell into a state of active relaxation or inhibition. In the reflex produced by the entrance of a crumb into the glottis, stimulation of the vagus first stopped breathing, then followed a large inspiration, and finally an expiration through the closed glottis, in other words, a cough. In the case of the child in whom the entrance of the crumb into the larynx caused death, he believed that death was due to arrest of the respiratory function from the spread of the inhibitory effect over a wide area of the central nervous system. Death in these cases was at first only apparent, and life could be restored by performing artificial respiration until the inhibitory effect had passed off. Dr. Spurgin's case might be similarly explained; a blow on the neck caused spasm of the glottis, thus bringing the vocal cords in contact and producing the same reflex result as a foreign particle and causing the same inhibitory effect. Blows on the upper abdomen excited a similar reflex through the fibres of the vagus in the stomach; it was noticeable that in all cases where death ensued the stomach was distended with a recent meal. In all these cases the dark colour and fluidity of the blood indicated that the actual cause of death was asphyxia.

Discussion.

SIR WILLIAM WILLCOX said that cases of sudden death where it was difficult to find a cause at the post-mortem examination usually fell under two heads—(1) those following a hearty meal followed by vomiting and the aspiration of some of the vomited material into the glottis causing sudden death due to violent stimulation of the vagus, and (2) those from immersion in water (not drowning), in which a little water entering the air-passages produced the same effect, an effect which might be heightened by the shock of the sudden immersion of the body. He suggested that vasomotor disturbances and the filling of the great splanchnic reservoir were also of great importance.

DR. H. DRINKWATER described a death following ethyl chloride anæsthesia of a boy aged 10. The boy had apparently recovered from the anæsthetic and

had been seen by the speaker apparently quite well. About ten minutes later he was called to the recovery room and found the boy dead. Artificial respiration and cardiac massage both proved useless. The medical man who performed the post-mortem considered death to be due to status lymphaticus, but with this he could not agree. He now reported the case because in this case as in some of Sir Bernard Spilsbury's it was noticed that the brain was very large and the skull very thin.

Mr. F. B. LEVY, who prosecuted Muchmore, inquired whether the first fight between Muchmore and Murphy could have had any effect in predisposing to the latter's sudden death from one blow struck in the second.

Dr. R. M. BRONTE reported two cases of sudden death where the cause of death was other than that which might have been supposed by the conditions in which the body was found. In another case during the administration of a spinal anæsthetic the man was dead before the needle was withdrawn, apparently from fright. It transpired that he had previously expressed to his relatives the greatest dread of operation. He had also known a case where a woman had died after trying to cause abortion in herself without having done herself injury of any sort.

Dr. F. O. MARTLEY quoted the case of a man buried for many hours in a landslide, yet able to converse with his would-be rescuers, who died as soon as a heavy plank was removed from his abdomen, as illustrating the importance of splanchnic dilatation.

Dr. SPURGIN and Sir B. SPILSBURY replied.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on March 6th, Dr. G. M. DUNCAN, the President, in the chair, when Dr. J. F. CHRISTIE gave a paper on

Tuberculosis of the Skin, with Special Reference to Lupus Vulgaris.

Dr. Christie divided the tuberculous skin affections into three classes: 1. The definitely tuberculous; where the tubercle bacillus is found in all, the classical histological appearances are present, the inoculation of susceptible animals is positive, and there is a local reaction to tuberculin. In this class are lupus vulgaris, scrofulodermia, tuberculosis verrucosa cutis, miliary tuberculosis of the skin, acute and chronic tuberculous ulcer. 2. The tuberculides; found in those who are "more or less tuberculous" and react to tuberculin. Here the histology suggests tubercle but the bacillus is only occasionally found, and it has been supposed that they are due to the circulation of toxins of tuberculous origin or to attenuated forms of Koch's bacillus. In the light of more recent knowledge, however, it must be admitted that these are forms of true tuberculosis due to the actual presence of the tubercle bacillus, but occurring in those who are putting up a good resistance to tuberculosis. The diseases in this class are thus analogous to the secondary syphilides, and include lichen scrofulosorum, the papulo-necrotic tuberculides, lupus pernio, and erythema induratum (Bazin). In these the eruptions are bilaterally symmetrical, and they tend to spontaneous cure. 3. The doubtful toxic tuberculides; including lupus erythematosus, pityriasis rubra gravis (Hebra), angiokeratoma, and psoriasiform tuberculide.

Dr. Christie then discussed the differential diagnosis of lupus vulgaris in its different manifestations—lupus simplex, exulcerans, fibroid, verrucosis, and mentioned the importance of a searching examination of the mucosa of mouth and nose as 75 per cent. of these cases present mucous membrane lesions. The diagnosis between lupus vulgaris and syphilis was particularly dealt with, and the difficulties of diagnosis in cases of these diseases co-existing were noted. The complications of lupus vulgaris were next mentioned, and in emphasising the gravity of lupus carcinoma Dr. Christie stated as his opinion that these cases were on the increase, and briefly discussed the treatment.

A full account of the treatment of lupus vulgaris was then given: general treatment by sunlight and fresh air; drugs, such as iron, arsenic, sodium morrhuate, thyroid extract, potassium iodide, tuberculin, and the arsenobenzol preparations; and local treatment by surgical measures, such as excision or curetting, freezing, X rays, Finsen light, the carbon-arc lamp, and various chemical agents, such as Brooke's ointment, acid nitrate of mercury, and trichloracetic acid. Special emphasis was laid on the necessity of long-continued treatment.

The lecture was illustrated by the exhibition of a large number of coloured plates and photographs, and by the demonstration of over 20 cases, and was followed by a short discussion.

Reviews and Notices of Books.

THE ACUTE ABDOMEN.

Diagnosis and Treatment of Acute Abdominal Diseases, including Abdominal Injuries and the Complications of External Hernia. Second Edition. By JOSEPH ADAMS, M.B., M.S., F.R.C.S., Surgeon to St. Thomas's Hospital, &c. London: Baillière, Tindall and Cox. 1923. Pp. 558. 16*s*.

IT is ten years since the last edition of this popular text-book was issued. The new edition has been thoroughly revised and in part rewritten, and over 20 illustrations have been added. As the author points out, more and more surgical work is being undertaken by general practitioners in cottage hospitals, and there is no doubt that a text-book of this sort will be very useful for their guidance. The first chapter is devoted to an orthodox description of the abdominal anatomy, but owing to the confines of space is of necessity very scrappy, and it is doubtful if it will serve any really useful purpose. For instance, less than a page is devoted to the lymphatics of the viscera, and the statements that the lymphatics of the stomach pass to the glands along the lesser curve, and that the rectal lymphatics end in the sacral glands are incomplete and consequently may mislead.

The clinical sections are very satisfactory. Stress is laid upon the importance of the history in arriving at the diagnosis, and the diagnostic symptoms of the individual emergencies are well and clearly portrayed, so that the work should be a very real help to those who have had but little experience of these types of lesion. The indications for treatment are also on the whole satisfactory, but a statement is twice made, in the advice given for the treatment of perforations, that the operation should be delayed if the patient is showing symptoms of much collapse. With this many surgeons would disagree, for it is now recognised that the results of operation are directly proportional to the time at which treatment is instituted. In view of recent discussions one would have hoped to see more attention paid to the value of blind cæcostomy in the treatment of acute intestinal obstruction. Although in the opinion of some authorities the treatment advocated by the author is the most satisfactory, there is a large group of cases in which a blind cæcostomy will hold out the greatest hope of saving the patient's life. It is unusual to find included in a book on acute abdominal diseases a discussion on the subject of dysmenorrhœa.

On the whole the work will be found extremely useful, and should certainly be in the hands of those who, not having large surgical practices, may suddenly be called upon to deal with an abdominal emergency. It should have and deserves a large sale to-day.

DISEASES OF WOMEN.

Fifth edition, revised and enlarged. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Clinical Professor of Gynæcology, Washington University Medical School. London: Henry Kimpton. 1923. With 934 engravings, including one colour plate. Pp. 1005. 50s.

OWING to the absence of the author on war service the revision of the fifth edition of this well-known work has been undertaken mainly by Dr. Hugo Ehrenfest. The book has enjoyed a considerable amount of popularity and this edition has been carefully brought up to date and is copiously illustrated and unusually complete. For example, there is included an account of the intra-uterine insufflation of gas to determine the patency of the Fallopian tubes in cases of sterility, with a full description of the technique, and the use of so-called pelvic pneumoperitoneum for purposes of diagnosis. In this some 800–1000 c.cm. of a gas such as carbon dioxide are injected into the peritoneal cavity either through the uterus and tubes, or directly through the abdominal wall, and then X ray photographs of the pelvis and abdominal cavity are taken. This is considered to be a great help in the diagnosis of such conditions as fibroids of the uterus, disease of the ovaries and tubes, especially distension of the latter, and in the recognition of the presence of adhesions in the pelvis. According to Peterson, who has done a large amount of work in perfecting this method of diagnosis, since its introduction the recognition of the exact nature of obscure conditions in the pelvis has greatly improved.

Some of the other rarer conditions of which descriptions are to be found in the book are trichomonas vaginitis, echinococcus disease of the uterus, fulminating pelvic œdema, and endometrial cysts of the ovaries. A good account with many illustrations is given of the pathology of subinvolution and chronic metritis, and the microphotographs of the differentially stained sections of the two conditions are most helpful. We notice that there is no mention of leukoplakia vulvæ in the index and find that the author describes this condition as a variety of kraurosis vulvæ. He evidently does not allow the distinction which is so commonly drawn at the present day between these two conditions or the fact that while the former appears to be a common precancerous state the latter seldom ends in that disease. The book contains a great deal of information not commonly found in text-books of gynæcology, and for this reason among others fills a definite place in the literature of the subject.

DYSENTERY IN THE FEDERATED MALAY STATES.

By WILLIAM FLETCHER, M.D., Bacteriologist, Institute for Medical Research; and MARGARET W. JEPPS, Protozoologist, Institute for Medical Research, Kuala Lumpur. London: John Bale, Sons and Danielsson, Ltd. 1924. Pp. 82. 10s. 6d.

WE have recently had occasion to draw attention to the instructive series of studies being issued from the Institute for Medical Research, Kuala Lumpur. The present volume fully maintains the standard of its predecessors. It deals with the ætiology, pathology, and treatment of dysentery as it occurs in the Malay States. The attention of the authors was immediately drawn to the remarkable contrast between the mortality-rate in Europeans and Asiatics: amongst the former two deaths from this cause have been recorded in the last three years. The mortality-rate amongst paupers, especially the half-famished malaria-infested Indian labourers, was as high as 26 per cent.; this, undoubtedly, had to be ascribed to the condition of the patients, not to any special virulence of the disease. Bacillary dysentery, then, is a disease of poverty. Taking the average weight of a healthy Tamil coolie as 112 lb., it was found that those who died had lost one-third of their body-weight, while in one extreme case the man weighed 3¼ st. Chronic malaria and atrophy of the internal organs, consequent on starvation, are held responsible for the loss of recuperative power. No evidence was obtained that malaria per se was responsible for dysenteric symptoms, or that lack of food or inability to assimilate it was responsible for beri-beric symptoms, but at the same time xerosis and pellagra occurred. As regards the ætiology, Flexner's bacillus was found to be 18 times as common as the Shiga organism. Double infections of amœbic and bacillary dysenteries were found, mostly at autopsy, in 13 per cent. of cases. As a general rule a fatal bacillary attack took place in the course of an amœbic infection. The carrier state in bacillary dysentery was found to be due to collections of these organisms lurking in ulcers, fissures of the mucous membrane, as well as in retention cysts.

It is satisfactory to note that much information recorded by British workers during the war has been fully confirmed. We may mention the employment of cytological methods, the failure of routine emetine treatment, and the vitality of the dysentery organisms in the fæces. Treatment with anti-dysenteric serum in debilitated natives was unfortunately found to be unsatisfactory, while vaccines injected appeared to be quite inert.

X RAYS.

Their Origin, Dosage, and Practical Application. By W. E. SCHALL, B.Sc. Lond., F.Inst.P. Bristol: John Wright and Sons, Ltd. Pp. 119. 5s.

THIS book should prove of considerable service because it gives a lot of quantitative information, and medical radiologists, as well as others interested in X ray matters, now have frequent recourse to numerical data in the current forms of therapy. The scope of the book is wide, in fact, perhaps, this is its chief weakness, for no one could treat adequately the subjects discussed in limited space. The author would, perhaps, have done well to omit that section which deals with the results of clinical treatment. Such matters can only be discussed in detail, but the author has had to fall back upon the statements of a certain limited number of people, and it is not in this way that general conclusions can be reached. In the technical and descriptive sections of the book the author is able to draw upon his own experiences, which have helped him to select most useful data and information. The first four chapters are devoted to the origin and properties of X rays, the apparatus necessary for their production and control, and the instruments in current use for measuring X rays. Then follow two chapters upon the practical applications of the rays in diagnosis and therapy. Not the least important part of the book is the collection of numerical tables which occupy the last fifteen pages. The book is well printed and illustrated by good line diagrams. It is a volume which will be useful to every radiologist.

UROLOGY.

Urologisches Praktikum. Second edition. By Prof. I. COHN, Berlin. Berlin: Urban and Schwarzenberg. 1924. Pp. 399. Swiss Fr. 11.25.

THIS manual is for students and practitioners rather than for the specialist surgeon. There are two large initial sections, one of which deals with urinary investigation methods, and the other with general symptoms such as pyuria, difficult micturition—an arrangement which is followed in a few English manuals of this class. Then follow chapters on the diseases of the several constituent parts of the urinary tract. The teaching all through, with few exceptions, conforms to English practice, and the information seems very reliable. The country of origin is labelled by the fact that much prominence is given to cryoscopy and indigo-carmine injections in investigating renal function. Phenolsulphonephthalein is said to have no advantage over indigo-carmine, but it is surely more easily estimated quantitatively. The urea-concentration test as we know it is not mentioned. It is to be noted that the author has obtained good

results from a modified Bottini operation in certain selected cases of enlarged prostate. This section on the enlarged prostate is systematically treated. The author regards pyelography as dangerous, but practically all risk has been eliminated by modern technical methods. He finds air distension of the bladder a useful diagnostic method, and it might certainly be used more often in this country with advantage. There are a number of very truly reproduced coloured endoscopic pictures of bladder and urethra.

The book can be recommended as a reliable guide to the inquiring student or practitioner.

QUANTITATIVE CHEMICAL ANALYSIS.

Twelfth edition. By FRANK CLOWES, D.Sc. Lond., Emeritus Professor of Chemistry in University College, Nottingham; and J. BERNARD COLEMAN, A.R.C.Sc. Dub., Head of the Chemical Department, Chelsea Polytechnic, London. London: J. and A. Churchill. 1924. Pp. 576. 18s.

IN something the same way as the name of Gray at once occurs to the mind when books on human anatomy are mentioned, this classical volume is associated closely with the subject of quantitative chemical analysis. From the publication of the first edition in 1891 to the present time it has been regarded as a standard work on the subject. The first chapters are devoted to descriptions of balances and how to use them; then follows a detailed practical description of all the well-known pieces of apparatus used in the subject. After these necessary preliminaries have been mastered by the student, he is taken through a complete course of analysis, the estimation of almost every inorganic element being described. The analysis of fats, oils, tannins, and soaps is dealt with, and there is a very fine section on the ultimate analysis of organic compounds. The chapter on gas analysis is rather out of date, and it is somewhat surprising that no account of Haldane's methods are given.

The new edition will be welcomed by many, and it is certain that the work will retain its high place in the literature on quantitative analysis.

JOURNALS.

THE BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXI. January–March.—In an article on "Idiopathic" Hypertrophy of the Bladder, by Dr. A. Dingwall Fordyce and Dr. Norman B. Capon, with a pathological report by Prof. Ernest Glynn, the writers review the literature and record two illustrative cases in children, aged 12 and 16, in which there was no tangible or obvious cause for the condition found during life or post mortem. During life the clinical picture resembled that of chronic interstitial nephritis in the large flow of albuminous urine and the marked renal inefficiency. On physical examination a globular hypogastric mass was found which was the hypertrophied bladder. The necropsy showed hypertrophy and dilatation of the bladder and dilatation of the ureters and renal pelvis, with cyst-like dilatation of the kidney tissue. The condition resembled pyloric stenosis, idiopathic dilatation of the œsophagus, and Hirschsprung's disease, for all of which there is probably some neuropathic basis. The paper is accompanied by numerous excellent macro- and micro-photographs.—Dr. H. S. Hutchison and Dr. Grace Stapleton contribute the first part of a paper on Late Rickets and Osteomalacia, in which they discuss the clinical position of puerperal osteomalacia, their conclusions being as follows: Pregnancy does not cause changes differing in any way from those occurring apart from pregnancy. There are the same incidence and occurrence, the same clinical signs, and the same radiological picture, irrespective of the occurrence of pregnancy. Osteomalacia may occur in men, so that pregnancy cannot be regarded as a necessary ætiological factor, but merely as a contributory factor.—Dr. Grace H. Anderson also contributes the first part of a paper on the Calcium and Phosphorus Content of the Blood in Normal and Rachitic Children, in which she concludes that though the blood-calcium is slightly more variable in rachitic than in normal children, the variability has no diagnostic or prognostic value, so that a study of calcium values alone is unlikely to prove of much assistance as an indication of cause or treatment.—In a paper entitled Anæmia with Enlarged Spleen in Infancy: "Infantile Splenic Anæmia," Dr. Grenville W. St. C. Ramsay reviews the literature and records his observations on 45 cases, which are classified as follows: (1) 27 showed all the features which are generally considered essential to justify a diagnosis of infantile splenic anæmia, such as anæmia, degenerative and regenerative forms of red cells, myelocytes in the peripheral blood, and enlargement of the spleen. (2) In 12 cases the blood picture was complete except for the presence of myelocytes. The spleen was enlarged in all. (3) In six cases the blood was typical, but there was no enlargement of the spleen. The writer concludes that the so-called infantile splenic anæmia is not a disease *sui generis*, but is a form of simple secondary anæmia.—Dr. Robert Hutchison and Dr. Gladys M. Wauhope report a case of Precocious Puberty in a girl aged 3½ years, in whom menstruation began at the age of 18 months. The period lasted for two or three days, and returned at regular intervals of 28 days, except on three occasions, when the interval was exactly two months. After the child's third birthday the intervals became irregular and of longer duration. Pubic hair was noticed at the time of the first period. The breasts were well formed, but no definite date could be given for their enlargement. On abdominal and bimanual examination under an anæsthetic both ovaries were palpable and of normal size. X ray examination of the skull showed no sign of tumour or other abnormality, but skiagrams of the skeleton showed a bony development usually present about puberty. The writers discuss the causes of precocious puberty—viz., hypernephromata of the suprarenal cortex, tumours of the pineal gland, and tumours or hyperplasia of the gonads, and came to the conclusion that the precocity in their patient was due to ovarian hypersecretion.—The abstracts from current literature are devoted to diseases of the blood.

New Inventions.

AN IMPROVED ABDOMINAL SUPPORT.

THE appliance here illustrated has been designed to give an efficient support to the lower abdomen, and to carry the weight of the abdominal viscera in intestinal stasis, enteroptosis, and lower abdomen post-operative cases, and at the same time to be comfortable to wear. The support consists of a single leather-covered and padded aluminium front and back plate with rubber pneumatic cushions, connected

by two lateral steel springs, hinged to, and sprung, or levered about, the lateral edges of the back plate, the right spring being detachable in front. The advantages are: (1) No pressure is exerted anywhere except on the front and back plates. The springs barely, or only lightly touch the body; this result is obtained by the leverage on the springs over the edges of the back plate when the support is in position on the body; this leverage also practically converts the appliance into a single-spring support, and so

necessitating a lighter spring than usually employed. (2) The back plate is centrally placed, and is padded to avoid pressure on the spine, and cannot press upon or bruise the gluteal muscles or large sensory nerves crossing the buttocks. (3) The attachment and release is easy to manipulate and under the direct view of the wearer. A simple partial release is fitted, easily adjusted without undoing the clothing, making it comfortable to sit or recline for long periods. (4) The appliance is light in weight and has 2½ inches of adjustment.

The support is made and supplied by Messrs. W. H. Bailey and Son, 45, Oxford-street, W.

GEORGE K. GRIMMER, M.D., F.R.C.S. Edin.
Weymouth-street, W.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

XIII.

LEGAL ASPECTS OF "DICHOTOMY."

BY A SOLICITOR.

Guise: "He that will be a flat dichotomist . . .
"Kill him!"
Ramus: "Oh, good my lord,
"Let me but speak a word."
—Marlowe, *Massacre at Paris*, Act I., Sc. 8.

IN a recent issue[1] was recorded the unanimous condemnation of fee-sharing by a meeting of consultants and specialists in a large provincial centre. The practice of "dichotomy," or secret fee-sharing, between a consultant and the general practitioner who has called him in, has medical aspects on which I am not competent to write. The practice has also legal aspects of a serious kind. Naturally the facts differ in each case, but we will suppose that a patient is attended by a general practitioner who advises an operation or a consultation, that the patient accepts the advice and leaves it to the practitioner to arrange for the services of the operating surgeon or consultant at a particular time, place, and fee, and that the operating surgeon or consultant, on being paid his fee, hands part of it over to the practitioner behind the patient's back. At once the following legal consequences result. If it be right to speak of the practitioner as having been the patient's agent (a point which will be returned to presently) the agent has taken a surreptitious profit in the course of his agency. An agent must not enter into any transaction in which he has a personal interest in conflict with his duty to his principal, unless the principal is fully informed and consents. If the patient is unaware of what is going on behind his back, he may, when he finds out the facts, insist that the practitioner (as his agent) shall account to him for the secret profit he has received. The agent must hand it over to the patient who otherwise can bring an action for the return of the money.

Possibly the practitioner and the consultant would plead in defence that such fee-sharing was a trade usage. For this plea to succeed, the court would have to be convinced that the practice was reasonable and that it was not only common but general. There is little doubt that the practice would not be held reasonable, for it alters the nature of the contract between patient and consultant without the knowledge of the former, and it gives the agent an interest in conflict with his duty to his principal.

Civil or Criminal Proceedings.

Thus far the reference has been to the legal aspect in civil proceedings. But dichotomy has a criminal aspect too. Under the Prevention of Corruption Act of 1906 "if any agent corruptly accepts or . . . attempts to obtain . . . any gift or consideration as . . . reward for showing any favour to any person in relation to his principal's affairs or business," he is guilty of a misdemeanour punishable with a fine up to £500, or imprisonment up to two years' hard labour. Might not a jury be asked to consider that the practitioner is showing favour to a particular consultant if he recommends to the patient, and procures the services of, one from whom he has the expectation of receiving, and perhaps on similar occasions previously has actually received, a kind of secret brokerage or commission? A corresponding offence under the Act is committed by anyone who gives money to the agent in these circumstances. Finally, it might be possible to frame an indictment under another part of the Act if the giving or showing of a receipt for the consultant's full fee could be proved to have deliberately misled the patient into the belief that the full fee had been properly received and represented a bona fide transaction.

The crux in the legal position is the question whether the practitioner acts as agent of the patient in obtaining the services of, and making the necessary arrangements with, the consultant. This is a question of fact. Agency may be inferred from the conduct of the parties. An agent is a person employed to bring the employer into legal relations with a third party. It is true that, in authorising his doctor to obtain for him the services of a consultant, the patient is asking the doctor to do something for him gratuitously. But dichotomy puts an end to the gratuitous element in the transaction. Moreover, where the transaction is gratuitous, the only legal difference is that the parties may have no legal remedy if the transaction is not carried out at all—i.e., if the consultant's services are not obtained. As soon as the transaction is under way and the patient meets the consultant, the question whether the agency was gratuitous or not becomes immaterial. Again, the patient may pay the consultant direct, but that fact does not negative the inference of agency. And, at any rate in the criminal statute which we have quoted, there is a wide interpretation of agency. An "agent" is defined as including "any person employed by or acting for another." The position of a defendant would be even more serious in a panel case, for the amending Act of 1916 provides that if money has been paid to, or received by, a person in the employ of a Government department or a public body, the transaction is presumed corrupt unless the contrary is proved.

No Legal Analogy.

No analogy from the legal profession can be craved in aid. A busy barrister sometimes (but by no means always) gives a part of his fee to another barrister who has "devilled" a case for him. Here there is no element of agency, for the recipient had nothing to do with the engagement of the barrister's services. If one could imagine a solicitor employing a barrister at a fee of 50 guineas with a secret understanding that the barrister should hand 5, 10, or 20 guineas back to the solicitor behind the client's back, or if one can imagine dichotomy between a general practitioner and the chemist who makes up his prescriptions, one gets a truer analogy. The gist of the offence is the improper secrecy. The effect of secret fee-sharing on the relations between the medical profession and the public is easily imagined. It must inevitably suggest that the consultant's fees are artificially and unjustifiably raised in order to provide a margin to cover the secret commission, that the patient is deprived of the genuinely disinterested advice he expects from his medical attendant, and that members of the medical profession are not above petty conspiracy to hoodwink the persons who pay for their services. It is fair to say that proceedings under the Prevention of Corruption Act are seldom successfully taken, owing to the difficulty of obtaining sufficient evidence. But for a medical man even to be acquitted on such a charge would hardly be edifying, and, if there be any doubt about the law, a practitioner will hardly desire to give his name to a leading case on the subject.

[1] THE LANCET, March 8th, 1924, p. 517.

THE LANCET.

LONDON: SATURDAY, MARCH 29, 1924.

MEDICAL EDUCATION IN CAIRO.

THE Royal School of Medicine at Cairo, formerly known as the Egyptian Government Medical School, and still better as the Kasr-el-Ainy Hospital and School, is an institution with a long and chequered history. Founded in Napoleonic times, afterwards fostered by MAHOMED ALI, it has languished from time to time, to revive under some foreign tutelage, which has been at various times, French, Italian, and British. Under the last two British directors, Dr. H. P. KEATINGE and Mr. OWEN RICHARDS, it has reached a high state of efficiency and developed into an important centre for medical education, being the only one in Egypt. The School is under the direct control of the Minister of Education, but the Under-Secretary of State for Public Health is also concerned in the administration of the hospital. The entry is limited to a hundred new students each year, selected from the successful candidates at the examinations for the secondary education certificates in science. The curriculum for the diploma of the Royal School of Medicine at Cairo has hitherto been approved by the Conjoint Board of the English Royal Colleges, who send a visitor to the examinations, which are conducted in English. The diplomates of the Royal School of Medicine are allowed to proceed direct to the final examinations of the Conjoint Board when they come to this country, a privilege which has been extensively used by Egyptian practitioners coming here to work for higher qualifications. The school at Cairo is well equipped and is staffed by a number of professors, who until recently have been mostly of British nationality with Egyptian assistant professors and demonstrators, although the chair of parasitology was formerly occupied by a German, Prof. ARTHUR LOOSS, who made very distinguished contributions to the literature of his subject. The clinical material at the hospital is almost unrivalled. There is an average daily attendance of nearly a thousand patients in the various out-patient clinics. Unfortunately, the hospital buildings are old and incapable of further extension or adaptation, with the result that the arrangements in the hospital are cramped, unsatisfactory and unworthy of the school. We understand that plans were in preparation for a new and up-to-date hospital near the school, but for some reason this scheme has not yet been put into execution. The present flourishing state of the school is without doubt due to the good work done by the English professors in the school and hospital with the loyal coöperation of their Egyptian colleagues, and special attention is given in the curriculum to subjects of importance in Egyptian practice, notably ophthalmology, parasitology, forensic medicine, and public health. A large proportion of the successful students enter the Government service, so that their familiarity with these subjects becomes of national importance.

Some time ago clinical units were established in medicine and surgery, and at the time Prof. H. B. DAY and Prof. R. V. DOLBEY are whole-time directors in charge of these units respectively. With their coöperation we have published in THE LANCET recently a number of original papers from the staff of the Kasr-el-Ainy Hospital showing what use is being made of the valuable material there available for research. The work of Prof. DAY[1] in the treatment of ankylostomiasis and bilharziasis is of great importance and has formed the basis of a concerted effort to deal with these parasitic infestations, from which it is calculated that at least 70 per cent. of the fellaheen suffer. His articles are well worth careful study as they are clear and practical, giving full details of the methods employed. An Egyptian lecturer on parasitology, Dr. KHALIL, has now been appointed, and he is engaged in research into the numerous problems presented by parasitic diseases in Egypt. Mr. F. C. MADDEN, the professor of surgery in the School, has published a valuable text-book on the Surgery of Egypt, which is admirably illustrated and covers well the field of surgical disease in Egypt.[2] We have tried in the contributions from the School published in our columns to bring these and other activities clearly before our readers. Among the papers on surgical subjects, which have been published in our columns, we may mention that of ALI BEY IBRAHIM on bilharziasis of the ureter,[3] and that by Prof. DOLBEY and IBRAHIM FAHMY on bilharzial papillomatosis of the rectum. In the latter the treatment of the condition by the operation of removal of the whole tube of mucous membrane of the rectum is described and illustrated. Probably few practitioners in this country have seen a case of hydrophobia. The paper by Prof. DOLBEY and Dr. ABDULLAH EL KALIB on hydrophobia in Egypt gives a striking account of this disease as seen in Egypt. We may also refer to the paper on the incidence of cancer in Egypt published in last week's issue of THE LANCET by Prof. DOLBEY and Mr. A. W. MOORO, as it contains some suggestive observations and indicates that there is scope for some original work on this disease in that country. The various papers to which we have referred show that the importance of original work and research is being recognised at the Cairo School. We may venture to hope that work of this kind will be encouraged there as it should serve to enhance the reputation of the school.

The alteration in the national status of Egypt and the recent political changes will doubtless have their repercussion upon the Royal School of Medicine. At present, the director, the two whole-time clinical professors, all the professors on the early subjects, and the senior member of the visiting staff in the three branches of medicine, surgery, and obstetrics are of British nationality; as until recently was also the professor of ophthalmology. Changes are already in progress, and there is no doubt that the policy of the Egyptian Government will be similar to that followed in other of the Government institutions—namely, the replacement of British members of the staff by Egyptians. No one denies the danger that such alterations may be made too quickly. Sudden changes are frequently disruptive and disorganising. The present state of the School is one of promise, provided it is equipped with an adequate hospital and guided wisely during its period of transition. Given such conditions it should develop into the most important centre for medical education and research in the Middle East. A too narrow interpretation of national aspirations might have the reverse effect and restrict the school to a very limited field with the loss of its recently won European status and recognition.

[1] THE LANCET, March 1st, p. 435; and 1921, i., 525.
[2] The Surgery of Egypt, 2nd edit., Cairo, 1922.
[3] THE LANCET, Dec. 8th, 1923.

CLINICAL RESULTS IN DEEP X RAY THERAPY.

SINCE the action of the X rays upon new growth cells was first observed continuous efforts have been made to treat successfully various forms of cancer. The degree of success has varied with different workers, and up to quite recently the work has been empirical in nature. Within recent years the treatment of cancer by X rays has received fresh stimulus from the published results of continental workers, notably those working at Erlangen; and all over the world radiologists and clinicians have tried to repeat these results, using in many instances the same form of apparatus and tubes, and as nearly as possible the same technique as that described by the continental writers. The question of technique is an important one, for the original Erlangen technique required for its execution an infinite amount of detail work; and it has been argued that the absence of any one of these details might reasonably be accountable for failure. It is obvious that if a test of the method is to possess any value the carrying out of the treatment must be done in exactly the same way as in the original.

This has not always been done. The discussion at the Royal Society of Medicine on March 21st, and reported on p. 649 of our present issue, was opportune in that, before a large gathering of radiologists and clinicians, the results of treatment received full consideration; a number of workers who had followed the original technique gave their experiences and results obtained in the treatment of a large variety and number of cases of malignant disease. There can be no doubt that the hope of curing cancer by the more intensive treatment, made possible by the production of more powerful apparatus and tubes, has induced many workers to enter the field, and to treat cases sometimes with greater enthusiasm than judgment, the consequence being that disastrous results have before now ensued. In this connexion the important point was made by several of the speakers that only selected cases, in which a chance of relief or cure could be looked for, should be subjected to the great physical strain of a complete intensive treatment; and it was frankly admitted that many of the cases which had undergone treatment in the past were quite unsuitable on account of cachexia, or a relatively low blood count. Brief reference only was made to the undoubted danger of over-exposure and its sequelæ, X ray burns and asthenia. The question of the single large dose and the divided dose in the treatment of carcinoma was fully discussed, arguments being advanced on both sides. There is little doubt that the divided dose, even if it has to be carried somewhat further in the aggregate than the single dose, is preferable, because of the lessening of the strain upon the patient. In actual practice it is found that results can be obtained which are quite as good as any so far produced by the single large dose.

After careful consideration of the large amount of clinical material available, the fact stands out clearly that a great advance in technique has been made in recent years in the treatment of malignant disease. Thus it would be unfortunate if the value of this advance should be lessened by an undue magnification of the failures in the results obtained by over-enthusiastic and possibly inexperienced workers. Such a sequence appears always upon the advent of a new technique, or the improvement of an existing one. The crucial test of radiotherapeutic measures will inevitably be the measure of the success obtained in the treatment of cancer; and in this direction it is obvious that the test is a severe one, particularly as up to the present in this country, at all events, the failures of other methods are handed over to the radiologist as a last resort. The critical test would require to be applied not to a hopelessly inoperable case of cancer, but to one which offers an equal chance of cure to either method of treatment. Nor should the radiologist alone be responsible for the case. A selected team of experts should watch the progress of the case during treatment. The observations of such a team working in accord would be of the greatest possible value in our estimate of the whole position. In radiation we possess no specific cure for cancer. Until we know more of the intricate changes in cellular growth and the changes occurring in morbid conditions it will be useless even to contemplate the possibility of a specific cure. A great deal of experimental work must yet be done before the biological processes of cell growth and the response to radiation can be understood.

The needed organised research should include the services of the clinician, the biologist, the biological chemist, the morbid histologist, and the radiologist. The assistance of the physicist will also be required for the elucidation of problems of physico-biological interest. The patient must be the first consideration in all attempts at cure by radiation or allied measures. Treatment should be carried out on rational lines, which are evolved from a consideration of physiological and pathological processes. If a very long exposure is contemplated, then all steps should be taken to ensure that the patient is in a fit condition to stand the strain. A careful consideration of the pathological processes at work, the condition of the tumour, the type of cell composing the bulk of its structure, and the state of the surrounding tissues, will in a large number of cases rule out at once any hope of a cure: the treatment must then become palliative, and in this group there is a large field for the radiotherapist. In an inoperable case of cancer combined treatment is the most rational procedure. The diathermy current will be found to be most useful in any such combination, while radium and X rays may be used singly or in combination. Fresh air, good food and tonics help toward the improvement of the patient's condition, aiding the action of radiations often to a marked degree. If treatment be carried out along these lines it will be found that occasionally an inoperable tumour will be so reduced in size that the possibility of operation can be considered; still more rarely a tumour entirely disappears and the patient is restored to normal health. The choice between surgical removal and radiotherapeutic measures, in a case of early cancer, does not at the present time exist; with average risks from the operation, there is no doubt that surgery is preferable, and most experienced radiologists are in agreement on this point, although at the moment it deprives them of the opportunity of applying what we called above the critical test. The value of prophylactic treatment was discussed by several of the speakers at the discussion on March 21st; this, in our opinion, should always follow surgical removal of malignant growths. Cases could be quoted, and are quoted, in which recurrence has taken place very soon after the commencement of prophylactic X ray or radium treatment. This may be difficult to explain, but the fact that a very large number of cases have recurred soon after operation is not an argument against operation in the majority of cases. A more cogent fact is that superficial recurrence has been temporarily cured in a con-

siderable percentage of cases treated by X rays, and this in itself is sufficient ground for continuing their application.

THE OPERATIVE TREATMENT OF CANCER OF THE LARYNX.

OPINION has not yet definitely crystallised on the subject of the most satisfactory methods of removal of cancer of the larynx in its various stages and in the various degrees of involvement of the organ. For most forms of extrinsic growth, and for intrinsic growths which have become extensive, it is generally agreed that total laryngectomy offers the only hope of cure; but a considerable difference of opinion still exists as to whether cases of early cancer confined to a vocal cord, or even to a part of it, should be submitted to laryngectomy, or whether in such cases the far less mutilating operation of thyrotomy, or laryngofissure, is sufficient to provide a really good prospect of eradicating the disease. The operation of thyrotomy, which was largely developed by the work of SEMON and BUTLIN, has been far more in favour in this country than abroad. Sir STCLAIR THOMSON has reported a series of 38 cases with one death from operation and but nine recurrences, and in America CHEVALIER JACKSON, in a series of 42 cases, had no immediate mortality and only five recurrences. Such results are surely as good as those for cancer operations in any part of the body, and, when one considers that the voice is usually very fair and that no other disability results, it might be expected that the question would have been definitely settled in favour of this operation.

In an interesting article in the last number of the *Journal of Laryngology* [1] Dr. J. E. MACKENTY, of New York, prefers a strong plea for the operation of laryngectomy for cases of early laryngeal cancer. Since 1917 he has rejected all cases of extrinsic cancer for the good reason that, during several years of surgical effort, he had not succeeded in ultimately saving one. But it is the question of the early cases which we are here considering. Three of his cases were in a stage so incipient that the mobility of the involved cord was normal in two and but slightly impaired in the third; the neoplasm in all three occupied from one-quarter to one-third of the extent of the cords, leaving apparently normal tissue both in front and behind the growth. Nevertheless, they were submitted to laryngectomy. Dr. MACKENTY is quite convinced that the opinion of the majority would have condemned the radical procedure in these cases, "so wedded are laryngologists to conservatism in the treatment of laryngeal cancer"; and he is certain that careful microscopic study of the three larynges gave conclusive evidence that no partial operation would have saved the victims from recurrence. In two the areas of malignancy extended into the angle of the anterior commissure, and in the third it extended in both directions, stopping just short of the arytenoids and the anterior commissure. In contradistinction to this, Sir STCLAIR THOMSON states in his book on "Diseases of the Nose and Throat" that good results are even obtainable if the disease has spread across the anterior commissure, so that all one cord and a portion of the other have to be excised; and he gives an illustration of such a case treated by thryotomy and free from recurrence eight years after operation. So that it is doubtful whether Dr. MACKENTY'S proof is really conclusive. The operative results of his laryngectomies are very good, with a surgical mortality of less than 2¼ per cent., and he lays stress on the fact that many of his patients are leading useful and strenuous lives in business and professional careers.

In the same issue Mr. J. S. FRASER and Mr. DONALD WATSON, of Edinburgh, report on 14 cases of intrinsic cancer of the larynx. They conclude that thyrotomy is only indicated if the cord is still fairly movable and if the growth does not transgress the anterior commissure or reach the vocal process, and they point out the tendency to infiltrate between the thyroid and cricoid cartilages. In the larynx, as elsewhere, the chief hope at present lies in early diagnosis and early operation, and we would endorse the latter authors' conclusion that "They would like to see a notice in large type sent to all general practitioners as follows: Every case of hoarseness which lasts more than a few days should have the larynx examined. If you can't do it yourself, send the patient to someone who can."

[1] Journal of Laryngology and Otology, February, 1924.

THE AVAILABILITY OF PHYSIOLOGICAL KNOWLEDGE.

THE present plethora of scientific progress has its difficulties as well as its gains. It is by no means easy, and is becoming progressively harder and harder, for a man to gather in from all the varied lines of advance the items which are germane to his particular interests. And it is often from these side lights that he gets most illumination. Men like SYDNEY RINGER could know all about physiology as well as clinical medicine. Indeed, such a possibility was open to any industrious and retentive intelligence up to about 25 years ago. But no one could do it nowadays; it would be an appreciable part-time job for anyone to survey the contents of the journals of the sciences, which, though immediately connected with medicine, have not yet attained their majority. We print in another column a letter from Dr. T. LUMSDEN putting forward cogently the difficulty of securing that the progress of anatomical and physiological knowledge shall be reflected in any clinical work to which it may be applicable. The difficulty is a real one; many of our readers are possibly unaware of Dr. LUMSDEN'S own investigations on the location of the various respiratory centres in the medulla and pons which have appeared during the last 12 months or so in the *Journal of Physiology*. And in the end the difficulty is a very old one, for it is the difficulty of knowing all about everything.

Nevertheless, a good deal might be done to diminish the difficulty. Anatomists, physiologists, biochemists, geneticists, and so on, can of their own initiative do little; they do not know what particular topics are of interest to the clinician, and if they have been duly attentive to their own studies they will find that in the 10 or 20 years which have gone by since their own experience of the wards—if, indeed, they have had such experience at all—clinical problems have greatly changed. It must rest with the clinician to extract for himself what is of moment to himself; he alone knows the problem which interests him and can appreciate which pieces of information are of value in that particular connexion. How to know what information is available is the real difficulty. Dr. LUMSDEN suggests that the clinical journals might publish more in the way of reports on scientific progress, and that the Royal Society of Medicine might have sections for the ancillary medical sciences. Both projects would probably be useful, though some might doubt whether the people concerned will put up with any more meetings than are held at present, and it is possible that a section of physiology, for example, would be frequented only by physiologists. On the whole we should attach more importance to improvements in the available current literature. The new American journal *Medicine* provides admirable reviews by experts which deal, despite the title, almost entirely with what is ordinarily called physiology or pathology. The *Physiological Review* again covers in much the same way topics which, mostly physiological, range into such medical subjects as the ætiology of rickets. It should certainly be possible for the clinical journals to report to their readers the titles of the monographs which appear in these two most useful publications; the originals are available at the libraries if they happen

to be wanted, and some, at any rate, of the papers in *Medicine* are republished and may be bought separately. In rather a different category come the abstracting journals with short accounts of original papers only roughly classified. The most obviously useful to English clinicians is *Physiological Abstracts*, which appears every two months; an hour would suffice to run through the pages and learn if mention is made of anything of particular interest to a particular reader. The trouble about this admirable magazine, skilfully guided through its early years by the zeal of Prof. W. D. HALLIBURTON, is that it will come to an end next year unless it receives a measure of support more equivalent to its virtues; perhaps a wider circulation among clinical workers would be enough to save it.

These are specialised publications which in their several ways would help to realise Dr. LUMSDEN'S ideal if clinicians are keen enough to keep in touch with them. And other branches of the natural sciences have journals more or less in correspondence. No one can be on all the advancing fronts simultaneously, and it would need a good deal of assiduity to apprehend the summaries of what is going on in each place. But an earnest worker can always do his best.

Annotations.

"Ne quid nimis."

JONNESCO'S OPERATION FOR ANGINA PECTORIS.

SURGEONS, in devising new operations, often provide anatomists and physiologists with fresh and very practical problems. Why should Jonnesco's operation of removing the middle and lower sympathetic ganglia of the neck relieve the pain of angina pectoris? A paper by Mr. R. C. Shawe, which we publish this week, helps us towards an explanation. He has discovered that in the sympathetic twigs which join the vagi and recurrent laryngeal nerves at the junction of neck and thorax there are medullated nerve fibres of various sizes. The fibres of large size he has followed to the cardiac and aortic plexuses, and rightly infers that they must serve as channels for afferent or sensory impulses concerned in the reflex control of the heart. If we suppose that these lower cervical sympathetic twigs are the pathways by which abnormal impulses reach upper dorsal centres of the cord and there give rise to anginal radiations, then we have a satisfactory explanation of the rationale of Jonnesco's operation. The same twigs apparently serve as pathways for secretory fibres to the thyroid gland. Mr. Shawe's communication will serve to remind the rising generation of medical men how much there is still to be done in unravelling the structure and function of the great sympathetic plexuses of the thorax and abdomen and how practical the results are which will issue from investigations of this kind. Mr. Shawe acknowledges indebtedness to Prof. J. S. B. Stopford, the occupant of the chair of anatomy in the University of Manchester, who has demonstrated how successfully anatomical and clinical methods of research can be combined. Dr. James Ross, the founder of the neurological school of Manchester, was a physician; his work was continued by a surgeon—the late Sir William Thorburn; and in continuing and furthering researches into the structure and nature of the nervous system the anatomist has returned to his proper rôle in medicine.

IMPROVEMENTS IN OPTICAL EQUIPMENT OF OTO-LARYNGOLOGISTS.

The last number of *Acta Oto-Laryngologica* (vol. v., fasc. 4, 1924) contains ten original articles, seven of which deal with improvements in the optical equipment of the oto-laryngologist. Austrian, French, German, and Swedish specialists have written these papers which show how much the recent work of Gullstrand, Holmgren, and others has done to facilitate the examination at close quarters of objects hitherto imperfectly seen in the respiratory passages and ear. It is a very remarkable fact that though binocular vision was much appreciated in the 'sixties and 'seventies of last century, its value came almost to be forgotten, and laryngologists were satisfied during the past half century to use only one eye at a time. The average housewife, familiar with the difficulties of threading a fine needle with the help of only one eye, could have told them how badly they were handicapped. According to Dr. Carl von Eicken, of Berlin, the inventor of the binocular system of lenses for throat, nose, and ear specialists, many physicians remain under the impression that they are using both eyes when examining the interior of the ear, nose, and throat. One of the most interesting optical instruments described is the relascope, which enables the wearer to enjoy binocular vision, and two other observers, one on each side of the wearer, to look through its side windows and to see with monocular vision the same object that the wearer of this instrument is seeing and operating on. The teaching value of such an instrument is obvious. Other instruments described are the spectacle magnifier of Gullstrand, a binocular telescopic lens, an otomicroscope, and glasses to protect the operator's eyes from spurting blood and pus. A paper by Prof. G. Holmgren, of Stockholm, shows to what practical purposes recent improvements in optical instruments can be put in this field. With the help of a binocular microscope, he has recently operated on four cases of otosclerosis, the labyrinthine capsule being incised under the microscope with a degree of precision which would have been impossible without such control. In three of the four cases his attempts to make an artificial window in the labyrinthine capsule achieved a certain degree of success, auditory perception being improved, and no permanent injury inflicted on the neighbouring structures. Such operations for otosclerosis must, in Prof. Holmgren's opinion, be still regarded as in the experimental stage, but it is already evident that the prospect of their becoming perfected is greatly enhanced by the important advances recently made in optical instruments.

AUTOPSIES AND DEATH CERTIFICATION.

THE scientific value of a death certificate unsupported by the evidence of a post-mortem examination was the subject of a recent discussion[1] at a meeting of the Medical Society of Berlin, and, as might have been anticipated, the unconfirmed clinical diagnosis was severely criticised. One of the speakers, Dr. Lubarsch, deplored the fact that the present campaign in favour of economy was invading even the post-mortem room, and he insisted that the curtailment of post-mortem examinations could not be regarded with equanimity by any who were interested in public health. To show up the incorrectness of the Prussian mortality statistics not based on a post-mortem examination, he compared them with certain necropsy statistics. According to the Prussian mortality statistics, there were 922,350 deaths in 1920, of which 52,476, or 5·6 per cent., were due to cancer, and 5531, or 0·6 per cent., were due to other new growths. In only 5 per cent. of all the deaths had a post-mortem examination been conducted, and among the necropsies performed in the two-year period 1920–21 in the hospitals throughout Germany, there were 8301 cases, or 9·7 per cent., showing carcinoma, and 683, or 0·8 per cent., showing sarcoma. The incidence of malignant disease was thus shown to be much higher by the evidence of post-mortem examinations, than by that of uncontrolled clinical diagnoses. Even when the cancer was superficial, it was not infrequently overlooked by the clinician, and 4·93 per cent. of the 1297 cases of external cancer were undiagnosed during life. In another 3·24 per cent.

[1] Deutsche medizinische Wochenschrift, Feb. 15th.

the site of the disease was wrongly located, and 10·86 per cent. of the cases of superficial sarcoma were not recognised as such. Of 5908 cases of internal cancer, 17·17 per cent. had escaped diagnosis altogether, and in 15·04 per cent. the disease had been wrongly located. Thus diagnostic mistakes were made in 32·21 per cent. of the cases of internal carcinoma, and in the case of internal sarcoma, this mistake-rate was still higher, being 44·7 per cent. Of 450 cases of pulmonary and bronchial carcinoma coming to necropsy, 240 had been wrongly diagnosed. As was pointed out by Dr. Benda, who took part in the discussion, post-mortem examinations are not only of value in the compilation of truthful statistics, but also in forming a just opinion in traumatic cases, and in adjudicating on pension and insurance claims. As another speaker pointed out, necropsies discourage ill-considered diagnoses. The time when a necropsy is regarded as an unavoidable preliminary to burial may still be far distant, but when it comes it will assuredly witness a more careful and skilled physical examination of the patient than is usual at present.

THE HOSPITAL WORK OF THE SALVATION ARMY.

COMPARATIVELY little appears to be known by the general public of the medical and hospital work which the Salvation Army is doing in various parts of the world. In a recent issue of the *War Cry*, the official organ of the Salvation Army, an account is given of some of the activities carried on at home and abroad by means of the international medical service organised by this body. In Great Britain the medical work appears to have grown directly out of the maternity homes which were opened in most of the great cities for the benefit of unmarried mothers. In response to public demand these facilities were extended, and lying-in hospitals for all classes of women were subsequently founded in London and the provinces. The Mothers' Hospital at Clapton, which was opened in 1913 by Princess Louise, Duchess of Argyll, is perhaps the best known of these institutions. The value of the work carried on here may be gauged by the fact that during 1923 1129 births took place in the hospital, and 1493 under the direction of the Mothers' Hospital district visiting staff.

The medical work in *India* is represented mainly by three large hospitals—the Catherine Booth Hospital in Nagercoil, Travancore, the Emery Hospital in Gujerat, and the Thomas Emery Hospital in Moradabad, United Provinces. From the Emery Hospital a medical motor-van goes out among hundreds of neighbouring villages, taking skilled surgical relief to thousands of ignorant villagers. Two hundred cases weekly are treated by this means alone; while in many other centres are village dispensaries from which simple remedies and appliances are distributed. During 1922 51,254 patients were treated by the Salvation Army in India, and 451 major and 1989 minor surgical operations were performed. The *Dutch Indies* are well served by the Salvation Army, one outstanding piece of work being that carried on at the William Booth Eye Hospital at Semerang under the direction of the well-known Danish ophthalmic surgeon, Dr. W. A. Wille. During a recent year there were no fewer than 43,650 consultations at this institution. Another branch of work, no less valuable, is connected with the four leper settlements founded by the army in the Dutch Indies where leprosy is very rife. A maternity home has been established at Soerabaja, attached to which is a children's clinic and an institution known as a policlinic at which 47,128 patients were treated during 1922. A new hospital which will accommodate some 80 patients is now in course of erection at this centre. Apart from these institutions there are a number of medical stations in Java and elsewhere at which ailments are treated by simple remedies administered by non-medical workers.

In *China* plans are being laid for the erection of a large hospital. *Japan* boasted the only Salvation Army tuberculosis sanatorium in the world, 351 patients having been treated here during 1922. Medical work, however, received a severe set-back through the earthquake and fire on Sept. 1st of last year. The hospital in Tokio was completely destroyed, but within a few hours of its destruction a temporary hospital for expectant mothers had been established among the ruins. In *Cape Town* the William and Catherine Booth Memorial Hospital for Women and Children, the first of its kind in the Union, has proved a boon to the people. A training school for midwives and nurses has been incorporated with it, and there is a widespread demand for the services of students who have received their training here. Hospitals and maternity homes are in operation in many centres throughout the *United States*, dental clinics also being common. In *Canada* the Grace Hospital for Mothers, at Winnipeg, has over 200 beds which are always full. More than 1400 births took place there during 1922. Edmonton and Halifax also possess well-equipped hospitals. In *Australia* representative institutions are the Bethesda Hospital, Melbourne, and the McBride Maternity Hospital, Adelaide.

While there may be conflicting views as to the wisdom of using medicine as an approach to evangelisation, there can be no doubt that in the world-wide activities briefly outlined here the Salvation Army is rendering social service of a high order. Pioneer work such as this, carried on in places in which there is no question of overlapping must command admiration and sympathy.

ELECTROCUTION OF MOSQUITO LARVÆ.

Dr. José F. Montellano, of the Argentine National Department of Hygiene, has had, says the *Semana Médica* (Buenos Aires), the happy thought of employing electric currents in the destruction of the larvæ and nymphæ of anopheles and other transmitting species in infected zones. Dr. Montellano has demonstrated by his experiments that the larvæ possess but a feeble resisting power to electric currents whether continuous or alternating. An official trial took place recently in Dr. Wernicke's department of the Bacteriological Institute, in the presence of the electrical engineer (Señor Luis J. Sidler) to the Anglo-Argentine Electric Company. Señor Sidler was impressed by the results obtained and promised, on behalf of the company, the necessary technical assistance for experimentation in the open. It is hoped that the new method will prove efficacious in the campaign against paludism. Dr. Araoz Alfaro, President of the National Department of Hygiene, has the matter under consideration with a view to a grant of the necessary funds for a trial of the method in the neighbourhood of Buenos Aires, and should the results be satisfactory, for the organisation of a large-scale campaign in the paludic zone in the centre and north of the Republic.

THEORIES OF PLACENTAL CIRCULATION.

THE subject of the placental circulation, with some aspects of which Prof. J. E. Frazer dealt in the Harveian Lecture before the Harveian Society on March 20th, forms an interesting chapter in the history of anatomical medicine. From the time of Galen it was held that the umbilical vessels of the fœtus were directly continuous with corresponding vessels in the mother, artery with artery and vein with vein. An almost necessary corollary of this belief—partly resulting from it, and partly, no doubt, leading to it—was the idea that the fœtal heart did not act. It is a curious thing that such a false opinion was held throughout the time when Aristotle, who had described the beating heart of the chick in the egg, was held in such high esteem, but it may be explained, perhaps, by this very fact, inasmuch as the chicken being a creature which, in the nature of things, cannot link up with the maternal vessels, is therefore not in the same category as man and his nearer allies. Whatever may be the reason, the theory itself was, as Prof. Frazer showed, of great importance in affording ground for the Galenical explanation of the fœtal

circulatory structures. This explanation was upset, of course, by the Harveian teaching, and Harvey expressly denied the anastomosis between maternal and fœtal vessels. But he was not by any means the first to do this. Arantius probably holds pride of place in this respect, for, in his excellent account of the anatomy of the placenta, he describes the two circulations as separate, and denies any anastomosis at all between them. He was followed by many others, but his opinions were not upheld by Fabricius, Maitrejan, and Perpessac. Heister also seems to have been a disciple of the old school in this respect, and it is curious to find even Cheselden, as late as 1795, affirming his belief in the maternal blood supplying the fœtus. We note with satisfaction that, speaking generally, the leading men in this country were at one in following Hunter, whose own observations caused him to support Harvey.

A NEW ALCOHOL METHOD FOR PREPARING INSULIN.

IN a recent paper[1] by Dr. H. W. Dudley and Mr. W. W. Starling are recorded experiments on variations of the Collip process for the preparation of insulin. As pointed out by the authors, Collip's method consisted in the extraction of pancreas with plain alcohol; Doisy, Somogyi, and Shaffer improved the yield by the addition of acid to the extracting alcohol, whilst the present authors modified the method by using alkaline alcohol. They were led to this by the observation that insulin is readily adsorbed to a substance in a neutral or slightly acid medium, but not to anything like the same extent in an alkaline medium. They hoped that an alkaline solution would wash out the insulin more thoroughly. In spite of the fact that an alkaline solution favours tryptic action, it was found that their hopes were realised, and that a considerable improvement in the yield resulted. From a series of 43 experiments the optimum concentration of bicarbonate in the alcohol was found to be 85 g. per kilo of pancreas. The average yield of the whole series was 257 rabbit units, whilst that of the last eight, when the conditions had been standardised, was 412 per kilo. In one experiment 508 units were obtained. These yields are very much above those obtained by the plain or acid alcohol process. The paper represents a very large amount of valuable work. It was evidently in the press before the publication by Dr. E. C. Dodds and Mr. F. Dickens of the acetone-picrate process whereby methods of any kind involving the use of alcohol are likely to be superseded, and even higher yields obtained than those here recorded. The paper includes an important modification of Dr. Dudley's method of purification of insulin which will, in any case, be of substantial value.

THE HEALTH OF THE INDIAN CHILD.

THAT a systematic effort is being made to study and combat disease among children in India is shown by the special children's number of the *Deccan Medical Journal* (vol. ii., No. 1, January, 1924), edited by Mr. Hyderali Khan, F.R.C.S. Edin., who a few years ago was resident medical officer of a London children's hospital. This volume contains a number of articles, written by members of the Hyderabad Medical Association, describing the symptoms and treatment of the more prevalent children's ailments. These are not, as might perhaps be expected, ailments peculiar to tropical climates; they are the same ailments as occupy the attention of a London children's hospital, although their relative frequency presents striking differences. Rickets is mentioned only to emphasise its rarity, while infantile diarrhœa and tuberculous peritonitis, the two diseases in which we have noticed the most striking diminution in England during the last decade, appear to be extremely prevalent and even to be increasing. Dr. A. L. Sayeed, in his article on infantile diarrhœa, states that this ailment is commonly secondary to broncho-pneumonia, which would appear to be a reversal of the usual sequence in this country; he attributes the infection to swallowed sputum. Perhaps the most significant statements concerning the spread of children's diseases are found in the article on surgical diseases, by Mr. R. N. Coorlawala, F.R.C.S. Eng., superintendent of the Afzulgunj Hospital, relative to the serious increase in the incidence of surgical tuberculosis in the last 14 years. Of a total of 13,780 children treated in hospital during one year, over 8000 required surgical treatment, and the majority of these were tuberculous. The writer states that the increase has taken place among all classes of the community, and attributes it to such causes as the introduction of tuberculous cattle and to the large amount of dust due to vehicular traffic: he believes that over 50 per cent. of the abdominal cases are of the bovine type of infection, but gives no figures for the gland and joint lesions which formed the majority of his cases. He has, on the other hand, observed abdominal tuberculosis, even of the ascitic type, in breast-fed infants. Therapeutics receive their share of attention in this volume, and the description by Dr. Namasiwayam of an effective specific for pertussis —*Pongamia glabra*—which grows wild in the Indian forests, may well excite the envy of English physicians. The seeker after novelty will find it in the review of a recent work on infantile cirrhosis of the liver, a disease now becoming prevalent, which is "confined usually to the first male child of rich Hindus." The human side of the treatment of the child has not escaped the notice of the writers, and their efforts to combat the prejudice and superstition of mothers and "ayahs" are described with shrewdness and humour. The volume should be of real value to Indian practitioners.

THE INFLUENCE OF THE FACTORY SURGEON IN INDUSTRIAL WELFARE.

WE have recently indicated in a series of special articles the probable trend of future development in factory hygiene and some of the more pressing requirements of the moment. In a letter which appeared in our issue of March 1st Prof. E. L. Collis argued that, although industry needs a medical service, the post of certifying factory surgeon has existed for 80 years, but has failed to develop with the development of knowledge. It looks as though a new opportunity is now to be afforded to the surgeon. On March 22nd it was announced that the Home Secretary had appointed a committee to inquire into the working of the provisions of the Factory and Workshop Acts for the medical examination of young persons as to their fitness for employment in factories, and to consider the following points:—

(*a*) Whether the existing requirement of a certificate of fitness limited to a particular factory should be modified; whether any other changes should be made in the examination and certificate; and what arrangements should be adopted for the future.

(*b*) What measures should be taken for linking up the examination of young persons under the Factory and Workshop Acts with their examination under the school medical inspection service, and, if considered desirable, with other public health services of the country.

(*c*) What arrangements could best be made for providing medical supervision of young persons (where such supervision is considered necessary by the department) during employment in factories or processes where the conditions of work are unfavourable to health or physique.

The insufficiency of the services at present rendered is acknowledged by the certifying surgeons themselves, and their Association, in a report which is abstracted on p. 668, calls for extended activities. The Association holds that obligation lies upon the Government to establish "a sufficient and properly organised factory medical service," and it has in contemplation a definite scheme of procedure designed ultimately to promote this end. The most important points raised are the mechanism whereby the extended medical supervision and the

[1] Improvements in the Preparation of Insulin: Alkaline Extraction of the Pancreas. By H. W. Dudley and W. W. Starling. Biochemical Journal, 1924, xviii., 147.

raised standards of examination for young people, admittedly desirable, are meanwhile to be provided for. The advantage both to employers and the certifying surgeons to be gained by an extension of the duties of the latter is undoubted, and association of these surgeons with voluntary efforts such as welfare schemes should certainly be encouraged. In order to give some guidance to employers and surgeons on the remuneration that may fairly be demanded for additional work, a scale corresponding to that paid by infant welfare centres (a guinea per hour's work) is suggested as a minimum, and the recommendation is made that charges should be always per week, month, or year, never per visit paid. It is not likely that in the present state of national finance a comprehensive scheme of industrial medicine will be introduced by any Government. The suggestions made by the Association are likely to be useful in the interim, and indeed might well form the basis on which an Industrial Medical Service could be founded. Of especial value would be the closer association of doctors with the welfare workers, and the advice given to the latter on medical matters connected with their duties might with advantage include some talks on psychology. The factory hand who, when asked what troublesome factor in his conditions of work he would most like removed, replied "the welfare worker," voiced the legitimate resentment of many of his kind at tactless interference. With the help of the factory surgeon, the efforts on the part of the welfare worker to increase the comfort as well as the efficiency of the employee might be guided into directions which would be appreciated not only in increased output, but in greater content.

THE COMPOSITION OF BAYER "205."

SINCE its introduction Bayer "205" has always been surrounded by an air of mystery amounting almost to romance. Its powers as a trypanocide were at first said to be miraculous, whilst its toxicity was, according to all accounts, incredibly small. Its composition and formula were rigidly guarded, but the authorities of the Farbenfabrik Bayer stated that the substance contained neither arsenic nor antimony. The material was supplied only on the distinct understanding that it was for clinical use, and the person to whom it was entrusted had to give his word that no attempt would be made to determine its constitution. The clinical value of "205" cannot be doubted, since many eminent authorities, including P. H. Manson-Bahr[1] and F. K. Kleine,[2] have published series of cases treated with the remedy. A full review and bibliography of the clinical side of Bayer "205" is given in a recent article in the *Annales de l'Institut Pasteur*.[3] It would appear that the much vaunted low toxicity is apparent rather than real. For instance, in practically all of the recorded cases there has been albuminuria, which is quite a rare symptom following salvarsan treatment. In many cases 1 g. of Bayer "205" is followed by albuminuria, whereas 0·9 g. of salvarsan (N.A.B.) can be given at weekly intervals without any such sign. The ratio of the curative to the lethal dose may be very small, but the ratio to the dose causing toxic symptoms appears to be fairly high. The medical, and at the same time the national, value of "205" can hardly be over-rated. German workers have gone so far as to suggest that in "205" lies the key to Africa. It is thus not remarkable that for French and English authorities to obtain this substance was a very difficult matter, and it became obvious that independent research into the constitution, if successful, would be of the greatest possible value. Fourneau, Tréfouel, and Valleé started work with this object in view, and in the article referred to have put forward the formula of a substance which they state to be identical with the German Bayer "205" They were hampered at the outset by the difficulty of obtaining even a small quantity of the German substance. They were able, however, to overcome the rigid conditions laid down by the Bayer Company, and by "une voie très detournée," they obtained a few centigrammes. Indications of the lines upon which to work were obtained by studying a series of patents taken out by the Bayer Company on complex urea-like substances, obtained by coupling the amides of amino naphthalene sulphonic acids. Starting with these compounds and armed with a knowledge of the work done on salvarsan, these investigators set out on what appeared to be an almost hopeless task. Chemically it is possible to have an infinite number of compounds, and, at the same time, it is all but impossible to be sure of the exact manner in which the acids are coupled in any given substance. The investigators must have been imbued with wonderful hope and keenness. As they say, "Bien des fois même, découragés, nous avons eu le désir d'interrompre la poursuite d'un but qui sembiait fuir devant nous." Their courage and patience seem to have been rewarded, since in their compound "309" they appear to have produced a substance identical with Bayer "205" They reproduce the formula and state that its chemotherapeutic ratio—i.e., ratio of curative to toxic dose—is equal to that of the original German compound. Owing to the small quantity of "205" at the authors' disposal, it was impossible to prove beyond doubt that the two compounds were the same, but in all the reactions that they were able to try both substances behaved in an identical manner. The therapeutic tests were carried out on mice, and the final clinical test has yet to be performed. The authors are making trials of "309" in Africa, and it is hoped that good results will be obtained. If these are satisfactory, as one is justified in hoping, the discovery of "309" will form a landmark in chemo-therapeutics; but whatever the outcome of the clinical tests may be, the zeal and patience of the authors deserve the utmost commendation.

[1] THE LANCET, 1922, ii., 1265. [2] Ibid., 1924, i., 384.
[3] Recherches de Chémiotherapie dans la Série du 205 Bayer. Par E. Fourneau, Mme. Jacques Tréfouel et Jean Valeé. Annales de l'Institut Pasteur, Fév., 1924, No. 2, p. 81.

A NEW TREATMENT FOR HYPEREMESIS GRAVIDARUM.

AMONG the various morbid manifestations which may happen to a pregnant woman that of vomiting, which may become uncontrollable and constitute a danger to life, is undoubtedly the most important, and its treatment has for a long time been a problem among obstetricians. It is unnecessary here to enumerate the various therapeutic and operative measures which have been employed to combat this disease, but we may call attention to a new method which Dr. Pietro Castagna [1] has recently put forward. He claims to have obtained excellent results from the intravenous injection of a concentrated solution, 35 per cent., of chloride of calcium given in doses of 2 c.cm., a cure having resulted after the third or second or even after the first injection. His technique in order to avoid injury to the perivascular tissue is as follows. Before inserting the needle into the vein in the elbow, care is taken by aspiration that it does not contain any trace of the fluid, and the injection having been made a little blood is aspirated several times and re-injected into the vein so that the walls of the needle are well washed out, as to ensure that after it is withdrawn from the vein not the least trace of the caustic fluid is left in its track. By this method any sloughing action upon the paravascular tissues can be avoided, the slight erythema produced being easily remedied by wet applications. Details of five cases are given, four of which were primiparæ and in whom the vomiting was of an uncontrollable character. Treatment by morphine, adrenalin, orexin, oxalate of cerium had failed to relieve the violence of the vomiting, so that in one case rectal feeding had to be resorted to. All the cases responded promptly to the injections of chloride of calcium and the pregnancies went on to full term. These reports seem encouraging enough to

[1] Il Policlinico, Practical Section, xxxi., Feb. 25th, 1924.

justify a further trial of this method of treatment before having recourse to artificial interruption of pregnancy in the more severe cases.

PLANTS AND MEN.

ALTHOUGH Sir Frederick Keeble made no direct mention of medicine in his delightful address last week at the Royal Institution on the Plant Commonwealth and Its Government, yet there was much in what he said which appealed particularly to the trained medical mind. The lecture was largely concerned with the transmission of messages in plants. Sir Frederick Keeble depicted the vegetable organism as being constantly assailed by impulses to which it reacts. He showed how the plant cell is more constantly subjected to stimulus than are the cells of our own body and how mistakenly we employ the term to lead a "vegetable existence." Moreover, the sensitiveness of the plant is so acute that it can react to the stimulus of a weight so minute that it would be imperceptible to the most sensitive human skin. The transmission of impulses is carried out in the lecturer's opinion by hormones. The plant commonwealth is Victorian—it has but one means of transmission, the old post office—as opposed to the neo-Georgian animal mechanism, with its telephones and wireless, its nerves and arteries, veins and lymphatics. Experiments in which the growing tip of a leaf or of a root is removed and then stuck on again with a layer of gelatine through which hormones can pass were related to prove the route by which plants transmit messages in their commonwealth. The activity of plant cells in response to trauma, and the damage done to the wounded surface by over-washing were illustrated by diagrams, and were of extraordinary interest to the medical man when compared with the latest teaching of aseptic and antiseptic surgery. There can be no doubt that advances in human physiology and therapeutics might well follow on experiments devised on the lines described by Sir Frederick Keeble.

THE L.C.C. SCHOOL MEDICAL STAFF.

LAST week the London County Council came to a decision which will result in a reorganisation of its medical department. Following the example of the Ministry of Health, a new grade of officer has been created, designated "senior medical officer," with stipend appropriate to the position. By effecting certain economies, the cost of the department under the new scheme will be less than formerly, with the result that it has been possible to increase the salaries of the assistant medical officers. Perhaps the most interesting part of the scheme is the declaration that in the future greater use will be made of part-time officers than has heretofore been the case. Diverse views are still held as to the advisability of the public medical services being composed entirely of whole-time officers or largely of part-time officers, and it is noteworthy that the London County Council should after considerable experience of either course resolve that "as large a proportion as possible, compatible with efficiency, of the subordinate medical staff should be engaged on a part-time basis." Apart from the senior officers there are at present 30 full-time permanent assistant medical officers in the department, and these posts will be reduced to 23 as and when opportunity arises. Eight assistant medical officers, who are engaged on a yearly basis, are to be replaced by part-time officers. This is the extent of the contemplated change in the immediate future.

NOBLESSE OBLIGE.

WE understand that Lord Banbury has in the House of Lords, as previously on two occasions in the House of Commons, stated that he had the authority of THE LANCET for an assertion that dogs were not necessary for experiment. Such a statement is untrue, and Lord Banbury has already been informed that it is misleading.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXIV.

THE TREATMENT OF CERVICAL ADENITIS.

A CONSIDERABLE amount of discussion has taken place in recent years concerning the nature of enlarged glands in the neck. Formerly, it was the custom to regard chronic cervical adenitis as practically synonymous with tuberculous adenitis, but there was no real evidence for this view. The assumption that the persistence of a chronic enlargement of a gland is due to the tubercle bacillus is valueless. Investigation of the glands, after removal, in cases clinically identical often fails to show any tuberculous lesion, whilst bacteriological examination of the glands often only shows the presence of a streptothrix, streptococci, or staphylococci, and these, in many cases, apparently of a low degree of virulence. Consequently, it is now increasingly realised that a large number of cases of chronic adenitis are, at any rate in their earlier stages, of a simple nature and dependent on some chronic irritative lesion. The subject of local irritation in respect to the development of tuberculous glands is an exceedingly important one, and it has, I think, been proved satisfactorily that in a large majority of cases the incidence of a tuberculous process in a glandular group has been preceded by injurious irritation in some part of the region drained by the lymphatics afferent to the group.

Causes other than Tuberculosis.

In the region of the neck there are so many sources of possible irritation that the most thorough investigation must be undertaken before any drastic treatment of the actual glandular enlargement is embarked on. The scalp must be examined for impetigo, seborrhœic eczema, pediculi, and other lesions. The possibility of oral sepsis must be investigated, and carious teeth, alveolar periostitis, unhealthy tonsils, or ulcerative lesions of the fauces, tongue, and floor of mouth looked for. The ears must be examined for any evidence of discharge, whether due to infections of the external auditory meatus or to chronic suppurative otitis media, whilst adenoids must be looked for in the nasopharynx. It is not easy to say by which route the infective process more commonly enters, but it is probable that in the majority of cases in children, unhealthy tonsils and adenoids and carious teeth are responsible. It is quite remarkable, at any rate in the south of England, how the number of cases of extensive cervical adenitis has diminished since the teeth and tonsils have been properly attended to, so that it is quite unusual to see patients with large masses of glands in the neck, though this was quite a common sight 20 years ago.

That the tonsil is a portal of entry has been, I think, satisfactorily proved, and recently published investigations by Dr. S. R. Gloyne and myself [1] over a series of 300 cases of unhealthy tonsils associated with cervical adenitis showed that the infecting organisms were mainly streptococci (hæmolytic and non-hæmolytic) and pneumococci, whilst the tubercle bacillus was only found in the tonsil in 5 per cent. of the cases. If, as is probable, tuberculosis is a late and superadded infection, the most important factor in the treatment of chronic glandular enlargement, with a view to the avoidance of extensive operative interference, is the complete elimination of all primary foci of infection. If this is effected it will be found that in a large number of cases the glands subside and eventually disappear. Complete resolution should not, however, be expected always to take place immediately, and occasionally a year or more may elapse before the glands finally disappear. In slow cases especially, though it applies to all, good fresh air, preferably in the country or at the seaside (the latter usually better for adults)

[1] THE LANCET, 1923, i., 1202.

combined with the maximum of sunlight together with the use of syrup of iodide of iron, are most useful adjuncts. It is doubtful whether any external applications such as iodine influence the course of resolution perceptibly. Although in a large number of cases the glands tend to disappear under the general treatment outlined above, there remains a residue of cases in which the enlargement of the glands persists.

Conservative Methods.

This group may be dealt with either conservatively or radically. The exponents of conservative methods pin their faith to a carefully thought-out régime of sunlight and country or seaside air, metabolism being raised by graduated exposure to the open air and by sea bathing. Should a gland break down it may be dealt with by aspiration with a sterile needle and the application of pressure or the injection of bismuth and iodoform emulsion. Merely emptying the gland will, in many cases, cause it to subside. If frequent aspiration is likely to be necessary the use of a seton is sometimes advocated. This method is more commonly adopted in France, but recently has had its advocates in this country. If this method is tried, a seton made of a double thread of strong silk, with the points of entrance and exit at some distance apart, is probably best and it may be left in for two to three weeks. At the end of this time suppuration has usually ceased and a cure is obtained with the formation of very small punctiform cicatrices which are hardly visible. As a rule, however, broken-down glands heal satisfactorily if opened by a small incision, their contents evacuated, and the abscess very gently scraped. It should be drained, not packed, by a small ribbon of bismuth gauze.

X rays have been found of great value in the healing of sinuses, often one or two applications being sufficient. X rays are also particularly useful in enlarged glands where a good deal of periadenitis is present. Injections of tuberculin in properly graduated doses, at suitable intervals, have in some instances proved a useful help. There is no doubt that under such treatment as the above large numbers of cases of cervical adenitis have become perfectly well. Many of these cases had been proved to be of a tuberculous nature, and the fact that they were cured tends to show how remarkable is the natural reparative power of the body against tuberculous infection.

Radical Methods.

The advocates of the more radical method of treatment do not deny that by many methods of treatment improvement, and possibly cure, may be brought about; but they are inclined to doubt whether such cures are permanent or the methods applicable to the more extensive cases the tuberculous nature of which has been definitely proved. They also maintain that the time of recovery would be shortened considerably by surgical treatment. In such cases more active surgical intervention is suggested as the alternative. Naturally, the extent of the operation must depend on the requirements of each particular case, but it should be the aim of the surgeon to get rid of the whole mass of infected glands as thoroughly and completely as possible. I have already mentioned that it is quite unusual to see many cases of very extensive cervical adenitis in the south of England, but they do undoubtedly occur in other parts of the country, and this fact must demand special and perhaps more radical methods of treatment. Incidentally, a clue may be afforded to the cause of the numerous cases of extensive disease occurring in a particular locality and the possibility of some form of preventive treatment being instituted. Some years ago an elaborate investigation by Dr. A. P. Mitchell [2] showed that cow's milk containing bovine tubercle bacilli was clearly the cause of 90 per cent. of the cases of tuberculous cervical glands in infants and children residing in Edinburgh and district. If such is still the case it is obvious that this source of infection could be dried up at once if the local authorities possessed and used proper powers for the control of the milk-supply, or if all milk was sterilised before use.

It must, however, not be assumed that this explanation holds universally, and the extent to which the milk of tuberculous cows is actually responsible for the infection of mankind with tuberculosis is very variable in various places. Statistics on similar lines to those just mentioned give the surprisingly low figure of 4 per cent. in Berlin, whilst in Italy the infection of human beings with tubercle bacilli of the bovine type is almost equally uncommon.

Advanced Cases of Proved Tuberculous Nature.

Be this as it may, the necessity of dealing with advanced cases of cervical adenitis of a tuberculous nature is still present. It is maintained by the advocates of helio-alpine treatment that progressive insolation in high alpine surroundings does produce remarkable cures even in advanced cases, and that large masses of indurated and adherent glands may be completely absorbed in six months, or where sinuses are present the whole infected gland may be extruded as a sequestrum, and the sinus rapidly heal with the formation of a supple scar. In this country, however, extensive surgical removal of the whole infected area provides the best chance of a satisfactory result. In the neck such procedure may involve the complete dissection of the infected glands in the anterior triangle, but may also demand the sacrifice of the sternomastoid and the elimination of all the posterior group of glands lying on the splenius and levator anguli scapulæ muscles. Excellent results have been obtained from such drastic procedures as these, and the necessity for them should not either be overlooked or dismissed.

Conclusion.

In conclusion one may say that (1) all primary foci of infection (tonsils, teeth, &c.) should be eliminated and adequate time allowed for the subsidence of the secondary adenitis; (2) if this fails to occur, conservative surgical methods combined with general and special therapeutic measures should be tried; (3) in the more extensive cases a thorough and complete removal of the whole of the infected glands should be effected.

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Surgeon to the Throat Department, St. Thomas's Hospital.

[2] Brit. Med. Jour., Jan. 17th, 1914.

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. J. A. Charles, late R.A.M.C., Mila., to be Capt.

MILITIA.

Capt. D. M. Lyon to be Maj.

TERRITORIAL FORCE.

Maj. A. W. Howlett, from the half-pay list, is restd. to the estabt.

Maj. A. R. Moodie to be Lt.-Col. and to comd. 152nd (High.) Field Amb.

D. R. Owen to be Lt.

Sanitary Companies: Maj. (Bt. Lt.-Col.) R. E. Lauder is ret. on completion of tenure of comd. of the 7th Southern San. Co., and retains his rank.

D. W. E. Burridge (late Lt., 5th Bn., W. York R.) to be Lt.

TERRITORIAL ARMY RESERVE.

Lt.-Col. H. F. W. Boeddicker, from active list, to be Lt.-Col.

Capt. G. F. Hardy, from active list, to be Capt.

ROYAL AIR FORCE.

Flight Lt. (Hon. Squadron Leader) A. G. Lovett-Campbell relinquishes his temporary commission on account of ill-health.

INDIAN MEDICAL SERVICE.

The King has approved the admission of the following: To be Lieutenants: J. E. Gray, J. S. Riddle, G. P. F. Bowers, R. McRobert, G. Dockery, J. C. Drummond, F. H. Whyte.

The King has approved the relinquishment of his temporary commission by Capt. Nawab-ud-din, who is permitted to retain the rank of Capt., and the retirement of Lt.-Col. S. A. Harriss.

Special Articles.

DRUG INCOMPATIBILITY.

A NOTE ON GENERAL PRINCIPLES FOR THE GUIDANCE OF PRACTITIONERS.

BY PERCY MAY, D.SC. LOND., F.I.C.

FROM time to time, most practitioners and physicians encounter cases of incompatibility of drugs with one another, or with the solvent or with the body fluids. In many cases these cannot be easily foreseen, and it is obvious that a detailed list of all recorded cases would be excessively lengthy—and, moreover, incomplete almost as soon as it were written. Certain general principles can, however, be pointed out as a help in avoiding pitfalls of this kind.

It is not proposed to deal here with cases of therapeutic incompatibility, but to confine our attention to chemical and physical incompatibilities. But in this connexion it should be noticed that an apparent chemical or physical incompatibility need not necessarily prevent the useful therapeutic action of the drugs. For example, the products formed by the double decomposition of two substances may be therapeutically equivalent to the original substances, and in this case the incompatibility is more apparent than real. Even if one of the products of double decomposition is insoluble it may be quite effective therapeutically, though in this case its formation is undesirable on account of the difficulty of ensuring accurate and uniform dosage in a mixture containing sediment. Instances of insoluble but therapeutically very active substances are numerous; it may be sufficient to mention calomel, which is one of the most insoluble salts known, and the purgative derivatives of anthraquinone, the therapeutic efficiency of which is roughly proportional to their insolubility. On the other hand, there are cases where the formation of insoluble substances may be very dangerous where these are of a toxic nature. In some cases this happens without the actual appearance of a sediment if another solvent be present in which the insoluble substance can dissolve and form a separate layer. A case of this type is quoted by Gilmour.[1]

Liq. morphinæ	1 oz.
Liq. atropinæ sulph.	20 minims.
Spt. ammon. aromat.	4 dr.
Spt. chlorof.	6 dr.
Aqua ad	6 oz.

In this case the salts cause separation of some of the chloroform as a bottom layer, and the spt. ammon. aromat. sets free the alkaloids from their salts. As the free alkaloids are far more soluble in chloroform than in water, they are extracted by the former, and are therefore concentrated in the bottom chloroform layer. Unless the bottle is well shaken before each dose, there is a possibility of the last dose containing a fatal quantity of alkaloids.

Incompatibilities of Drugs.

Taking first the most important group of incompatibilities, those of drugs with one another, we find first the simple cases which should be obvious to all possessing a rudimentary chemical knowledge. These include acids with alkalis, calcium salts with alkaline carbonates and phosphates, silver salts with chlorides, &c. Other similar cases, where two soluble salts react to give a precipitate, are well known, and need not be detailed. Their occurrence is readily manifested, and the cause can quickly be detected. As mentioned before, the formation of a precipitate does not necessarily affect the therapeutic efficiency of the mixture, but is usually undesirable on account of the difficulty of accurate dosage. Similarly, the incompatibility of an acid and an alkali need not in all cases be of significance, as long as the salts formed have the desired therapeutic effect, although in this case it would be better to prescribe the salt in the first instance.

Other cases of slightly less obvious incompatibility are those in which we have to deal with substances which, although not usually regarded as acids or alkalis, nevertheless react as such. Amongst compounds of acid reaction should be included salts of strong acids with weak bases, including most of the soluble inorganic salts of iron and the heavy metals, and a large number of the soluble salts of the alkaloids with strong mineral acids—i.e., hydrochlorides, sulphates, and nitrates. A substance of which the strongly acid nature is often unrecognised is saccharin. It is one of the strongest organic acids, and this fact should be recognised in prescribing it. In cases where its acidity may be undesirable, its stable and soluble sodium or ammonium salt (soluble saccharin) may advantageously be used instead. There are also some substances which are neutral when quite pure, but which readily give acid decomposition products when in solution or in presence of moisture. Spirits of nitrous ether and liq. ethyl nitritis are good examples of this type, and for this reason it may be advisable to neutralise the spirit with potassium bicarbonate before using it in mixtures where the presence of acid may be a disturbing factor.

Amongst the substances which it is inadvisable to prescribe with compounds of acid reaction are ammonium acetate, tartar emetic, all nitrites, the soluble salts of salicylic and benzoic acids, &c. The alkaline nature of the sodium and potassium salts of weak acids, such as the carbonates, is well recognised, but it should be noticed that borax is also strongly alkaline, and on this account is incompatible with many substances. Thus, for example, solutions of borax are sufficiently alkaline to absorb carbon dioxide with formation of sodium bicarbonate and boric acid, and when warm their alkalinity is even great enough to decompose chloral with formation of chloroform and sodium formate. Solutions of borax also precipitate alkaloids from solutions of their salts. Borax precipitates insoluble borates of nearly all the metals from solutions of their salts, though these precipitates are sometimes soluble in excess of borax or in solutions of ammonium salts. The presence of glycerine often prevents this precipitation. Borax and hydrogen peroxide, though not actually incompatible, should be prescribed together with caution, as hydrogen peroxide is unstable in alkaline solution, and the pressure of oxygen evolved from it may burst the container. On the other hand, the alkalinity of borax accounts for many of its valuable properties, such as its power of dissolving casein, fibrin, uric acid, and many resins, and of forming stable emulsions with many oils, often superior to those obtained with lime. One striking peculiarity of borax is the fact that it develops an acid reaction in the presence of glycerine, and is then incompatible with carbonates, from which it liberates carbon dioxide. Glucose, honey, and other polyhydroxy-alcohols share this peculiarity with glycerine. Another incompatibility of borax is that it forms a moist mass when triturated with alum, through liberation of the water of crystallisation of the latter. Sodium or potassium compounds of weak acids are sometimes strongly alkaline, and veronal-sodium, for example, is sufficiently alkaline to cause evolution of ammonia when prescribed with ammonium bromide. Potassium bromide should, of course, be used instead in this case. Soaps, also, have an alkaline reaction, and this should be remembered in connexion with soap emulsions and liniments. Many substances which are neutral when pure may be alkaline in the ordinary specimens met with in practice. For example, ordinary commercial sodium cacodylate is usually alkaline though it is neutral when quite pure.

[1] Pharm. Journal, 1916, xliv., 43.

Oxidising and Reducing Agents.

Another type of chemical incompatibility which may be foreseen by the application of chemical knowledge is that of oxidising with reducing agents. Some cases may be fairly obvious, but others are not so readily apparent. Amongst the oxidising agents used medicinally should be mentioned free iodine and preparations thereof; hypochlorites (including bleaching powder); organic chloramines, such as chloramine-T and halazone; permanganates; ferric salts (particularly the chloride); hydrogen peroxide; nitrites in the presence of acid, and notably preparations containing ethyl nitrite and amyl nitrite; nitric acid; potassium chlorate, &c. Reducing agents are not so frequently used as oxidising agents, but many substances can act as reducing agents in presence of a strong oxidising agent. For example, phenol (carbolic acid) readily reduces permanganate of potash, as do many other organic substances, and it is therefore useless to attempt to utilise the bactericidal properties of permanganate in conjunction with those of phenol. Alcohol and many other organic compounds frequently reduce strong oxidising agents. More definite reducing agents frequently used are sulphur dioxide, sulphites, hydrosulphites, and sulphides, ferrous salts, iodides in acid solution, most free metals, and notably mercury and nearly all finely divided or colloidal metals, formalin, paraldehyde, hexamine, and many other organic compounds. It stands to reason that an oxidising agent will be incompatible with a reducing agent, and these lists will indicate various pairs of incompatibles which might be encountered in practice. But a more remarkable incompatibility sometimes met with is that of two oxidising agents together which reduce each other with liberation of free oxygen. Hydrogen peroxide and permanganate are a pair of this type, and are reduced to water and manganese dioxide with evolution of oxygen, and therefore should not be prescribed together. Chloramine-T is another antiseptic oxidising agent to which this applies, as it reduces hydrogen peroxide with evolution of oxygen. Hydrogen peroxide is also reduced by alcohol, and is reduced catalytically by many substances, amongst which organic silver compounds are noteworthy.

Some Special Cases of Chemical Incompatibility.

We must now consider a few cases of special chemical incompatibility which cannot be referred to a general type and therefore cannot be so readily foreseen. One of these, which has been previously indicated, is that of chloral hydrate which is incompatible with alkali such as spt. ammon. aromat. with formation of chloroform and sodium formate. Hexamine is noteworthy among the substances which have many incompatibilities, and caution should always be used in prescribing it with other substances. Substances which can be converted by simple chemical changes into more toxic substances should, of course, be prescribed with great care, and should usually be given by themselves, and not in conjunction with other drugs. Calomel is one of these, as it is rather easily oxidised to corrosive sublimate. Bromides and iodides are dangerous with calomel, particularly in presence of oxidising agents, and free iodine or its preparations should be most carefully avoided when calomel is being administered. Another frequently quoted case of danger from calomel is its incompatibility with antipyrine. This is said to give a very toxic mixture, and it has been suggested that corrosive sublimate is formed according to the equation[3]:—

$$6\,HgCl + 2\,C_{11}H_{12}O_2N_2 + H_2O =$$
$$2\,Hg + Hg_2O + 2\,HgCl_2 + 2\,C_{11}H_{13}O_2N_2,\ HCl.$$

But this is doubtful, and it has been suggested that the formation of corrosive sublimate from calomel under the conditions of therapeutic practice is a myth. On the other hand, there can be no doubt of the need of the greatest caution in the use of calomel with organic compounds, as many of the organic mercury derivatives are most intensely toxic and far more dangerous than corrosive sublimate, so that the formation of only a trace of them would be attended with the gravest risk. This seems the more likely explanation of the poisonous incompatibility of antipyrine and calomel, and according to Paderi[3] a compound, $HgCl{-}N(CH_3)(OH){-}C_{10}H_9ON$, is formed, which is more toxic than corrosive sublimate.

Antipyrine is also incompatible with nitrous acid or with sweet spirits of nitre, unless the latter is previously neutralised, as free nitrous acid converts it into nitroso-antipyrine. Tannic acid or tannin is another substance of many incompatibilities. It is precipitated by ferric salts, silver salts, and many other metallic salts, by acids, and by gelatin. An example of a complex change in which more than two substances take place is furnished by galenical preparations of quinine and cinchonine which in presence of organic acids and ferric salts sometimes darken with the formation of quintoxin and cinchotoxin, both of them extremely toxic substances, especially the latter.

Another interaction of ferric salts with organic acids which is of interest is the oxidation of citric and other acids with evolution of carbon dioxide. This only takes place in daylight, and is a purely photochemical change. We have here, therefore, a physico-chemical incompatibility, and this forms a connecting link with the following section, which deals with cases of a physical rather than a chemical nature.

Physical Incompatibility.

The chief physical cause of incompatibility is the influence of one dissolved substance in lowering the solubility of another, whereby the latter is thrown out of solution. When one of the substances is of a saline nature, this phenomenon is often known as "salting out." This happens most readily when two substances are present having a common ion, as in the well-known method of purifying sodium chloride by passing hydrogen chloride into its saturated solution. In this way codeine bromide is salted out by an excess of sodium bromide, and very many other instances of this type are to be met with. As most salts are less soluble in dilute alcohol than in water, the presence of alcohol in any form is liable to cause crystallisation of sparingly soluble salts. Potassium chlorate, for example, crystallises out very readily in the presence of alcohol. Conversely, substances like chloroform which are more soluble in pure water than in salt solutions are thrown out of solution by saline substances, and there is sometimes a risk of chloroform being thrown out as a separate layer from prescriptions made up with chloroform water.

In powder mixtures trouble may be caused by another common physical property—namely, the mutual lowering of the melting-point (m. pt.) of the components of a mixture. It is well known that an impure substance has a lower melting-point than when in a pure state, and therefore it is not very surprising to find that where two substances of moderately low m. pt. are mixed, the m. pt. of the mixture may be low enough for it to be liquid at ordinary temperatures. For example, salol (m. pt. 43° C.) gives with antipyrine (m. pt. 114° C.) a mixture of m. pt. 30° C., with menthol one melting at 28° with chloral hydrate, one melting at 17° C. with camphor (m. pt. 175°), one melting at 6° C., and with guaiacol one melting at 3° C. The first two of these may liquefy in hot weather, and the others will be liquid at all ordinary temperatures. Sometimes a combination of three substances is necessary to produce this effect to an appreciable extent, a pasty mass being formed, for example, from antipyrine, phenacetin, and acetanilide when mixed together. Many other examples of this kind can be found. Another physical phenomenon which may cause solid mixtures to become fluid or pasty is the withdrawal of water of crystallisation from one substance, by another which dissolves in the water thus abstracted. Tartaric acid in this way forms a tasty mass with Glauber's salt or with borax. Many other examples of this type may be found when a substance very soluble in water is mixed with one containing water of crystallisation.

[3] Weidenkoff: Pharm. Zeit., 1910, lv., 780.

[3] Journal of Chem. Soc., 1920, cxviii., i., 94.

Incompatibility with the Body Fluids.

Having now dealt at some length with cases of incompatibility of drugs with one another, we will glance at a few cases where some part is played by the body fluids. The most important point in this connexion is the strong acidity of the gastric contents —namely, about pH 1·77 or about N/60 HCl. The alkalinity of the small intestine is of a lower order, and in this case the hydrolytic action of the pancreatic enzymes is of perhaps greater importance than the actual alkalinity. The two in conjunction hydrolyse, for example, acetyl salicylic acid into sodium acetate and sodium salicylate, and it will then react as a mixture of these. A case of possible incompatibility with the gastric contents is afforded by antipyrine and hexamine, which, under these conditions of acidity, form an insoluble crystalline compound.

Many interesting cases have been recorded of undesirable effects being produced by one drug reacting through the body fluids with another drug taken previously or by a drug taken internally reacting with another taken externally. For example, mercury oxycyanide is a non-irritant and valuable medium for bladder and urethra irrigation, but in patients under the influence of iodides it causes intense cystitis through formation of irritant mercuric iodide. A case has been observed[1] of severe burning of the skin on the application of hydrogen peroxide lotion to a patient undergoing internal treatment with potassium iodide through the liberation of free iodine. In the same way colourless tincture of iodine taken internally has caused great irritation of the skin on application of a mercurial ointment through the formation of irritant mercuric iodide. On account of the irritant nature of mercuric iodide, dressings of corrosive sublimate should not be used on wounds previously treated with tincture of iodine. If this should happen, the mercuric iodide is best removed by washing with potassium iodide solution. A similar incompatibility is recorded in the use of external applications of mercury and the internal use of sulphur compounds, brown or black stains of mercuric sulphide having been produced on the skin.

Incompatibility with a Solvent.

With regard to incompatibility with a solvent, the tendency of alcohol and other organic solvents to precipitate salts from aqueous solutions has already been indicated. Of course, all prescriptions should be made up with distilled water, but when the dilution of a mixture or the solution of a tablet or powder is left to the patient, tap water is generally used. In a few districts this is nearly pure, but most tap waters are hard, and so may often give untoward effects on account of the calcium and magnesium salts and sulphates which they contain. Most of these effects will be of a nature to be expected from such substances, and will include some slight precipitation of carbonates, phosphates, &c. The following is an interesting case of the effect of hard water recently noticed by us. Tablets of hexamine additive compounds, such as cystazol, readily disintegrate in soft or distilled water, but in hard water they only do so very slowly and with difficulty. By an apparent paradox, they disintegrate far more rapidly if allowed to soak in a small quantity of water to which the remainder can be subsequently added than if they are initially treated with the full quantity of water. The explanation is that in a small quantity of hard water there is not sufficient dissolved matter seriously to interfere with the disintegration of the tablet.

It is hoped that the foregoing review of the causes of incompatibility will be of some use in coördinating and classifying the large number of cases which are constantly being brought to notice.

[1] THE LANCET, 1912, i., 597.

THE Wellcome Historical Medical Museum will be closed from April 1st to the 30th inclusive for redecoration and cleaning.

REPORT OF THE ASSOCIATION OF CERTIFYING FACTORY SURGEONS

(1922–23).[1]

THIS report, which deals with a period of two years, opens with the remark that the Factory Acts are much in need of amendment and overhauling, and welcomes the announcement in the King's Speech of a consolidating Bill.

Reference is made to the considerable number of papers on industrial medical subjects read at the annual meeting of the British Medical Association in Glasgow (1922), and the holding of a conference of associations and bodies so interested, at the Royal Sanitary Institute, London, in June, 1923. This gathering was arranged by the League of Nations Union with the object of creating in the minds of those particularly concerned a more perfect understanding of the functions and activities of the International Labour Organisation, and a knowledge of how this body as a coördinating centre can materially assist external efforts by providing useful advice and information. Government factory and medical research departments, workers' unions, employers, welfare organisations, and medical associations made excellent response to an invitation to send representatives.

Work of the International Labour Organisation.

A valuable feature of the conference was a preliminary address by Mr. H. A. Grimshaw, one of the principals of the Diplomatic Section of the Central Office at Geneva, on the status and scope of the international organisation. Mr. Grimshaw referred to the common but erroneous belief that this institution is some sort of amalgamation of trade-unions, soviets, or brotherhoods, and pointed out its real position as a well-defined unit in the League of Nations constitution established by the Treaty of Versailles. He showed how its function is to secure by international action the adjustment of conditions of labour throughout the world to the requirements of justice and humanity, and that its constitution is by membership of subscribing States at present numbering 54. He explained how at periodical conferences, to which each member State sends four delegates, representing employers (one), employed (one), and the Government (two), draft conventions are formulated, recommendations with a view to coördinated legislation are drawn up, and scientific commissions of investigation are appointed. Also how a permanent staff at Geneva collects information from all quarters, both for conference needs and for the use of subscribing States, and that much of this would be available to recognised associations who cared to apply officially. He further stated that the fine library gathered together by the organisation would be at the service of duly accredited representatives of such associations visiting Geneva.

Four main industrial health questions were discussed: Safety and protection in industry; industrial fatigue; industrial disease and injurious processes; and the health of women workers. In all these discussions particular attention was directed to the influence which can now be brought to bear by the international organisation in coördinating the work of experts in various countries and in obtaining effective and uniform action among separate industrial communities. The various bodies represented certainly owe a debt of gratitude to the League of Nations Union for taking the initiative in bringing together this unique gathering of British experts.

The Position and Prospects of the Certifying Surgeon.

In addition to rendering an exceptionally useful account of the year's working, the annual report for

[1] Manchester, 1924.

1921 ventured to make a somewhat special feature of reviewing the position and prospects of the certifying surgeon. In dealing with this subject three points were specially emphasised. The first had relation to the obligations of the Government towards the establishment of a sufficient and properly organised factory medical service, and sought to demonstrate that, however desirable statutory reform might be from a health and efficiency point of view, there would be little likelihood of any definite official action being initiated whilst national finances are in so precarious a state. The second point dealt with the powerful move which is being made to influence industrial opinion on the advantages to be gained in health and efficiency from the voluntary establishment of welfare schemes and a sufficient measure of medical supervision over workers and work places. The third point dealt with the so-called works' doctor, the advisability of certifying surgeons getting into touch with the voluntary effort movement, and the mutual advantages to be gained by employer and surgeon if arrangements are made for the latter to take up, as far as possible, any extension of medical duties at factories within his own district. The Council had good reason to believe that the publication of the definite views of the Association on the subject of improved medical supervision and on its attitude towards an extension and a higher standard of examination for young people had met with the approval of contemporary bodies and associations interested in bringing about healthier conditions in industry.

At a conference organised by the Industrial Welfare Society to consider the "value of medical supervision in industry," which was held in Manchester on June 26th, 1922, the Association was represented by six members of the Council officially as well as by other certifying surgeons. The statutory position and duties of the certifying surgeon were explained by Dr. S. A. Henry, H.M. Medical Inspector; Dr. T. Watts, Dr. H. E. Watkins, and Dr. W. F. Dearden illustrated the advantages to be gained by employers making arrangements with certifying surgeons for extended services, and the particular advisability of doing this where welfare work was already in operation. Dr. A. Glen Park showed, from his own experience, what useful work can be accomplished by appointing the district certifying factory surgeon as medical officer to any continuation school established in connexion with a factory.

The willingness shown on previous occasions by the Welfare Workers' Institute to coöperate with the Association explained the interest taken by this body in the proposed increased scope of the surgeons' executive and advisory functions. The honorary secretary availed himself of an opportunity to discuss the new policy with Miss Voicey, who was then secretary of the Institute, and was assured that it would be heartily welcomed by her fellow-members. This lady, however, very properly pointed out that if welfare supervisors were to coöperate successfully in obtaining improved medical service it would be necessary to establish a clear understanding on the all-important item of cost to the employer. The honorary secretary of the Association (Dr. W. F. Dearden) agreed therefore to bring the financial aspect of the question to the notice of the council with a view of obtaining an authoritative opinion on the minimum rate of payment which would be acceptable to certifying surgeons generally. He further agreed to contribute an article to the monthly journal *Welfare Work*, explaining the additional duties which should be taken up, and how to arrive at a standard for remuneration. The council agreed that charges could be suitably based on the minimum fee recognised by the British Medical Association as suitable for work of a similar class—viz., one guinea per hour—and that a fair amount for an annual contract, based on one hour's attendance per working week, would be £50; time taken up in travelling to and from, when allowed for in existing contracts, to be a matter for additional consideration.

Proposed Extension of Existing Duties.

The article was published in the *Welfare Work* issue of November, 1922, and was made the subject of a leading article. Further, the correspondence columns of the two following numbers contained a series of letters which favourably criticised the scheme outlined. A copy of the journal containing the article was forwarded to each member of the Association. It may be explained briefly that extension of existing duties was advocated in the direction of (1) a more detailed examination of young persons, (2) extension of the examination of young persons between 16 and 18 years of age, (3) re-examination every 12 months up to 18 years of age, (4) supervision of ambulance and first-aid equipment, (5) advising welfare supervisors on medical matters arising in connexion with their duties. The basis of an annual contract recommended was £1 per hour for an estimated 50 visits per year. If one hour be allowed for each visit the annual amount would be £50, if two hours £100, and if half an hour £25 to £30. Particulars had been received of a number of contracts entered into on the lines recommended. The remuneration had mostly been based on one guinea per hour, but in some cases the basis was higher. The Council would, however, like to have more information as to actual arrangements, whatever the basis, than is at present available. This departure from old-established routine was likely to have considerable bearing on the future prospects of the certifying surgeon, and members were asked to communicate their experiences to the honorary secretary.

Agreements.

It was emphasised that in making agreements members should let it be well understood that the old method of contracting for statutory services is not being disturbed. The seven days' obligation respecting certificates of fitness cannot be lost sight of, and if there is an *annual* contract in existence it must remain as such. The new arrangement was only to be regarded as an extension of the old one. The duties were increased and the remuneration was necessarily greater, but the agreement should still be for the year and the accounts presented quarterly. It would also be found advisable to commence any extension of duties at the beginning of a quarter.

It must be understood that the annual amount arrived at on the basis outlined, though considered to be fair remuneration in average cases, was the lowest that could be accepted; also that in assessing this amount a year had been taken to represent 50 working weeks at a maximum and not likely to be less than 48. Special circumstances, such as the value of the existing contract or the amount of the minimum visiting fee obtaining in a particular district by arrangement with the occupiers, would have a definite bearing on any new arrangement. It should also be noted that, as statutory duties are involved, the extended contract should be arranged with "the occupier," or some responsible person acting on his behalf, and the details of new duties thoroughly explained. In all cases the surgeon should quote an annual sum for periodical visits (weekly or fortnightly) of a specified duration; he should never quote per visit if he can avoid it. How the amount is arrived at can be explained, but is no part of the contract.

Improved Type of Examination.

The improved type of examination contemplated in the scheme undoubtedly involved the introduction of the medical card. The setting out of the card should be as simple as possible, and, though not overburdened with spaces little likely to be used, the provision made should allow for essential details of every case. The sample card reproduced gave a fair impression of how the requirements might be met. As medical experts mostly regarded it as necessary to have all medical particulars respecting a worker on his medical card, and therefore ready to hand, the greater part of the space on the back should be ruled off to show dates between which the worker had been absent

through illness, or through injury inflicted at the factory, and the nature of such illness or injury. A smaller space could also be allowed at the back for special notes. The number of cases that could be conveniently examined in one hour must depend very largely on the amount of care taken with each case.

MEDICAL CARD.		*Young Persons.*	
Name.	Department.	Date of starting.	Date of birth.
Previous employments and duration.		Eyesight. R. L.	
Previous illness or injury.		Teeth (carious).	
Present disease, defect or deformity.		†Physique.	
		†Nutrition.	
*Not suitable for Recommendation.		Height.	Weight.
Date.	Re-examinations—results and recommendations.	Height.	Weight.

Date of Exam. Signature

* Strike out "Not" if suitable.
† Signs may be used—o = normal; − = under normal; + = over normal.

Experience showed that whilst eight examinations might be made when the cases are straightforward it was really much better to take six and avoid being hurried or exceeding the time limit. Heights and weights were to be taken by the welfare worker, not by the certifying surgeon.

An essential point was uniformity, and the most certain method of securing this was for certifying surgeons in the various manufacturing areas to meet and agree upon a policy suitable to the needs of the particular locality. The Council would be glad to hear of such meetings, and the results.

First-aid Arrangements.

It was noted that the annual circular letter of the Chief Inspector dealt with those parts of the new Compensation Act affecting certifying surgeons. A prominent feature was the insistence on a certain degree of first-aid equipment in all factories, and in making this provision it is curious how closely our legislature should cling to tradition. As the early Factory Acts did not provide for any inspectors to enforce the requirements, and as notification of industrial disease and poisoning, together with regulation of dangerous trade processes became law without any provision for medical supervision, so was this very essential equipment made compulsory without any effective means for securing its sufficiency or proper application. As the earlier vital defects were remedied in course of time, and as the Home Secretary appeared to have certain powers in this particular matter, it might eventually come about that first-aid and ambulance arrangements would be placed under some degree of supervision by the certifying surgeon.

THE Chelsea Hospital for Women, in connexion with the Fund being raised at the London Mansion House, has received for its nurses' home (now building) £105 from Sir John Mullens, and £50 from the Worshipful Company of Mercers.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Death of Sir Walter Buchanan.

THE death of Sir Walter James Buchanan, M.D. Dub., K.C.I.E., occurred at his residence in Dublin on March 23rd, after a few days' illness, at the age of 62. A native of Londonderry and educated first at Foyle College in that city, Buchanan had a distinguished career as a medical student in Trinity College, Dublin, graduating M.B., B.Ch. in 1887. In the same year he won the University Travelling Prize in Medicine and passed into the Indian Medical Service. After some time passed as house surgeon in Sir Patrick Dun's Hospital, and in the National Eye and Ear Infirmary, Dublin, he went to the East. He took part in the Hazara Expedition in 1888, and in the Lushai Expedition in 1890. He served in the Manipur Field Force in 1891 and was awarded a medal and clasp. In the following year he joined the civil branch of the Service. From 1899 to his retirement in 1919 he was editor of the *Indian Medical Gazette*, and from 1902 to 1919 he was Inspector-General of Prisons in Bengal. As a member of the Indian Prisons Commission he visited the United States, China, Japan, and many other countries. Since his retirement Sir Walter Buchanan has lived in Dublin, where he has given frequent lectures on his travels. He had a retiring disposition, plain exterior, and unassuming manner, but it was obvious to all who met him that he was a man of unusual character and ability. His unexpected death will cause regret both in Ireland and in India.

The Tax on Anæsthetics in the Free State.

Last week in the Free State Senate Dr. W. O'Sullivan moved, "That, in the opinion of the Seanad, ether, chloroform, and other drugs used in the relief of the sick should be free of taxation." He said that he would appeal to the Minister of Finance to do away with that tax in his next Budget. It was inflicting a terrible hardship on rich and poor alike. The tax was proposed as a protective tariff in England. He instanced two cases where the patients had died before the drugs ordered arrived from England. Senator Jameson suggested that a small central store of these necessary articles should be established by the Government. By that means the drugs could be got at the store by the people needing them on paying the necessary cost. The resolution was passed with the addendum that arrangements should be made to obviate delay in transmission.

Central Midwives Board of the Free State.

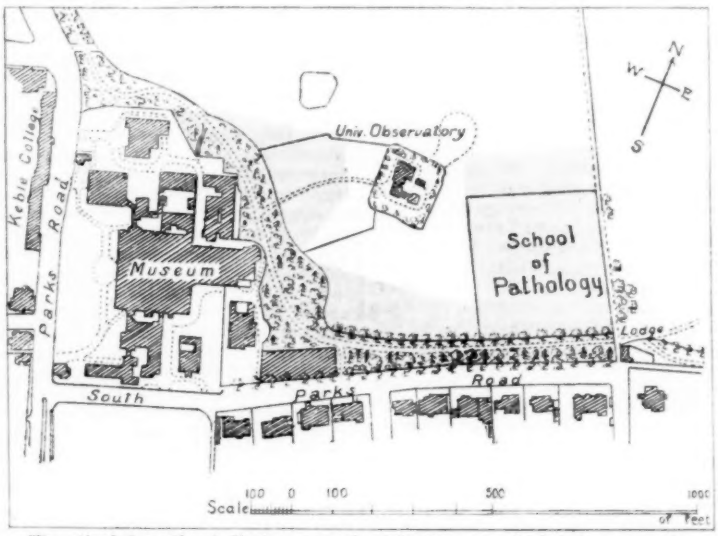
The first meeting of the recently elected Central Midwives Board for the Free State was held last week. Sir Andrew Horne was elected chairman and Senator O. St. J. Gogarty vice-chairman. Arising out of a letter from the Joint Nursing and Midwives Council for Northern Ireland, it was decided that no further applications for the enrolment under the Act of midwives who were trained prior to 1918 would be accepted by the Board, as six years have now elapsed since the passing of the Act. Such midwives will in future be required to pass the examination of the Board.

HORSHAM HOSPITAL.—This hospital, which moved into larger buildings, erected at a cost of £18,000, during the summer, is announced to be free of debt. It was noted at the annual meeting of governors held on March 19th that there was a balance on the year's working of £123 and a balance in the hands of the matron of £24. The contributory scheme had on Dec. 31st only been working for three months, but so satisfactorily has it been taken up that there are now 1750 contributors. The scheme brought in £196 in three months. The governors have been requested to consider the question of representation of the contributors on committees controlling the affairs of the hospital.

UNIVERSITY OF OXFORD:

EXTENSION OF SCIENCE DEPARTMENTS.

WE have received some particulars about the gift to Oxford University from the Rockefeller Foundation, and further details of the arrangements made by the University in connexion with it, and with the recent gift under the will of the late Sir William Dunn (pathology). A decree approved by Congregation on March 4th, and passed by Convocation on March 11th, proposed to set aside a certain area in the University Parks for the extension of science departments. A decree defining more precisely the space to be allocated to science departments was carried in Congregation on Feb. 20th, and subsequently in Convocation on March 4th. Had this decree been lost, an alternative decree was to have been brought forward at the same meeting; the opposition to the decree passed represented, for the most part, a preference for the alternative site, and not an opposition to the assignment of any site in the Parks. In the *Gazette*, in which notice of this decree first appeared, there was added a statement by the Hebdomadal Council, of which the following is a copy:—



The stippled portion indicates approximately the area which it is proposed to allocate in Decree 2 for extensions of the Scientific Department.

"*Note 3.*—The Hebdomadal Council is of opinion that the settlement arrived at by the above decrees would provide for the developments of natural science during the present generation, but not for the establishment of the forestry department in the Parks or for the transference to the Parks of the present botanic garden and department."

The accompanying rough map shows the area now assigned to scientific departments, which is a little over 9 acres in extent, and is at least 2½ acres larger than the whole area at present covered by scientific buildings. By the assignment of space in the Parks the future development of the departments of natural science is assured for a long time to come, since it will now be possible to draw up a considered scheme, instead of having to fight on each occasion to secure the immediately adjoining bit of land for any new building, irrespective of its convenience in relation to the future of other departments.

By the two magnificent gifts made recently to the University is secured not only a new department of biochemistry and a fully-equipped school of pathology with stables, paddock, &c., but also a new department of pharmacology in the quite modern pathology block—for which purpose the Dunn trustees have assigned £3000; also the whole space of the present department of biochemistry (part of the physiology building added in Prof. Gotch's time) becomes available for physiology, affording a very considerable addition.

It is suggested that the next requirements here (or among the next) are chairs and departments in hygiene and parasitology. The Regius Professorship of Medicine is only partially endowed.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Further Developments in the Battle of the Clubs.

THE so-called strike of medical men over certain changes which had been brought about in club practice, as described in these columns (THE LANCET, Jan. 19th, p. 154), has been called off by the Leipziger Verband in the greater part of Germany. The strike has ceased on the condition that the status quo ante will be restored until further arrangements are made, which will, it is hoped, allow the maintenance of the free choice system. In Berlin, however, the battle continues, although the Berlin Medical Union, following the instructions of the Leipziger Verband, offered to work again under the former conditions. The Berlin clubs declined to accept that offer and even to be represented in the meetings called by the authorities to reconcile both parties. The clubs tried to appoint their own medical officers hoping in that way to get rid of the free choice system, but the local Insurance Office gave notice that if no agreement was reached they would appoint a commissioner to administrate the working of the clubs. The clubs appealed to the District Insurance Office, which cancelled the decision of the local Insurance Office. The district office went to the length of advertising in the Berlin and provincial daily papers, inviting medical men to apply for appointments as club medical officers. Although the district office has declared that this step was necessary, as it bears the responsibility under the present law for providing adequate medical service, this obvious partiality has caused great indignation in the profession. Medical men say that if the clubs had accepted the offer made by the Berlin Medical Union a sufficient number of doctors would have offered their services. The issue of the battle will depend entirely on the firmness of the Berlin doctors. The list of doctors in club practice includes, at present, not more than 60 names, whereas the total for Berlin should be at least 1350, at the minimum rate of one doctor per 1000 club members, according to the provision of the law. The great majority of names on the list represent medical men who are known to be of a low professional standard; and some may have been compelled by need to act against the interests of their professional brethren. These club doctors have formed a medical union of their own and invite, through the press, medical men in Berlin and elsewhere to join them. Two of their leaders have been excluded from the Berlin Medical Society for breach of medical ethics, this being in the history of that

society the first instance of cancellation of a member for such reasons. The outcome of the battle, which at present is the principal topic of conversation in Berlin medical circles, will have a far-reaching effect on the Berlin medical profession as far as it is connected with club practice. English readers may conclude from this somewhat detailed report how great the difficulties of the German profession are and how little help they are obtaining from the Government in their struggle. This is the more regrettable, as in Germany non-club practice for the majority of medical men is almost an impossibility.

Statistics of the Berlin University.

Although academical circles and representatives of the liberal professions, including medicine, have repeatedly issued public warnings as to the present handicaps of a professional career, the number of students in the Berlin university, and in other universities likewise, has not decreased to any great extent, being 12,581 this year as compared to 12,741 last winter. Of this year's figures, the men numbered 10,872 and the women 1709. The newly matriculated students included 2494 men and 428 women. It is, however, remarkable that compared with the students in other faculties those of the medical faculty and the dental students showed a rather considerable decrease. This year 1781 medical and 186 dental students were inscribed against 2088 medical and 274 dental students last winter. Apart from the Austrian students who enjoy the same rights and privileges as the German students, the number of foreign students has again increased, being 2650 against 1750 in the previous winter, although the fees for foreigners have been considerably raised. Among the foreigners the Bulgarians are the most numerous, with 191 men and 60 women. The great number of foreign women students is altogether very striking when compared with the figures for German women students.

Government Reward for Life-saving Abolished.

Until recently the Government paid a reward of 10 marks to any person who succeeded in restoring life in a case of serious injury, or of attempted suicide. A non-successful attempt was rewarded with 5 marks. In the latter case, of course, the reward was paid only if there had been reasonable hope from the outset that the injured person could be saved, as people were known to claim the reward for trying to revive persons who had been dead many hours or even corpses which had been taken from the water in a stage of decomposition. Owing to the depreciation of the currency the reward has not been claimed during the last years as the sum of 5 or 10 marks was totally worthless, and therefore by a recent Government order it has been abolished. The Minister of the Interior stated that when the currency was again stabilised the Government would have no funds to pay an adequate reward, and expressed the hope that the absence of pecuniary reward notwithstanding, nobody would refuse help where a life was in danger. A reward will continue to be given in exceptional cases, where the rescuer has been put to considerable financial expense and personal risk.

PRINCESS ALICE HOSPITAL, EASTBOURNE.—The fortieth annual report presented at the meeting of governors on March 21st foreshadowed a further enlargement in the near future, two houses in Bedfordwell-road having been purchased during the year for the sum of £6000. Beginning with 12 beds only the institution has now 80 beds, the latest addition being a new dispensary. During the year 913 patients were admitted as against 963 in 1922, and 373 major and 280 minor operations were performed. The finances are in a satisfactory condition, the deficit having been liquidated by Mr. Sydney Hudson, J.P. The amount received from patients and their friends towards the cost of maintenance amounted to £1319, and the governors expect that when it is more widely known that patients are expected to contribute according to their means towards the cost of their maintenance, the payments will steadily increase. Sir Charles O'Brien Harding announced that Mrs. Fosdick had given £100 for an extra X ray apparatus in memory of her husband.

Correspondence.

"Audi alteram partem."

PHYSIOLOGY AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—A well-known orthopædic surgeon recently asserted in my hearing, with apparent satisfaction, that as a student he knew little about the anatomy and physiology of the pons and medulla and that what he then knew he had since forgotten. And yet anatomy and physiology are the basis of scientific medicine. In physiology, at any rate, new facts of some importance are being discovered every month, although it may be years before they are brought to notice of clinicians even of the consultant class and in large towns. This state of matters is partly due to slackness on the part of the clinicians, but I think quite as much to the aloofness of the scientists, who are apt to underrate the knowledge and intelligence of the practitioner.

To remedy this deplorable delay in the spread of useful knowledge I would offer the following suggestions: (1) There should be a chemical, an anatomical, and—most needed of all—a physiological section of the Royal Society of Medicine; to which scientists should be encouraged to contribute abstracts of progress in their particular departments. (2) The medical journals read by clinicians should, like the *Journal of the American Medical Association*, publish week by week reviews of scientific progress by first-class men. If suggestion (1) were carried into effect it might only be necessary to report accurately the proceedings at the scientific sections.

I am, Sir, yours faithfully,

London, S.W., March 18th, 1924. THOMAS LUMSDEN.

*** We deal with this letter in a leading article. —ED. L.

CERTIFICATES OF INSANITY.

To the Editor of THE LANCET.

SIR,—A letter in the *Times* of March 17th, headed Certification of Lunacy, should, I think, not pass unnoticed. In it certain suggestions are made, the first being that "local boards of mental hygiene" should be set up consisting of two doctors, two barristers, and two county councillors. To this board all persons in "observation wards" are to have a right of appeal, either personally or by counsel, and by it the question of their sanity is to be determined. It may well be hoped that the process of certification and ordering reception may become, for the protection of the medical practitioner, a more definitely judicial function than it is at present, but it is obvious that such a board, inspiring, from the nature of its heterogeneous composition, but little confidence, would be unwieldy, slow in operation, and of an insufficiently magisterial character. Any of us acquainted with the rapid and decisive action that is often required can picture a board dealing either with the acute maniac, or the argumentative paranoiac, and can imagine the queer results that would emerge.

The second suggestion is that general hospitals and Poor-law infirmaries should be provided with "observation wards" to which all "alleged lunatics' private or pauper," should be sent in the first instance. That general hospitals would do well to provide accommodation for certain types of mental illness is, I suppose, generally admitted, but to send all "alleged lunatics" to "observation wards," whether in general hospitals or in infirmaries, for a preliminary survey would be fantastic. It is our constant complaint that early stages of mental illness in the majority of cases pass unnoticed or are misinterpreted by both the patient and his friends. When a stage arrives at which the friends take action, there is seldom any kind of doubt that the patient is mentally deranged: no further observation is needed to establish the nature

of the malady, and the sooner consistent and uninterrupted treatment begins, the better. It is in a very small number of cases that any doubt arises or in which prolonged observation is indicated. To send every case, "public or private," to an "observation ward" would be to herd together in unconscionable fashion all sorts of persons who should decidedly not be together in the same wards, or, indeed, in "wards" at all; unless the term "observation ward" is to be so extended as to imply a mental hospital so equipped that patients could be classified according to their symptoms and placed some in one ward or private room and some in others. Expense alone would forbid such a mode of dealing with cases for the sole purpose of "observation."

A further suggestion, involving considerable cost, is that the opinion of an independent alienist should be sought in all cases in which a patient is considered to have mental symptoms. It may again be pointed out that in most cases the symptoms are as plain as a pike-staff to any layman, and it is just because they are so plain that the relatives have been moved to act. It is only in a very small proportion of cases that, so far as certification to facts indicating mental disorder is concerned, the opinion of a specialist is desirable. Another suggestion is that the patient should see his certificates. I am inclined to wonder if the author of the suggestion makes any distinction between the normal and the disordered mind. If a patient is capable of cognition of a certificate and can appreciate the character of the data upon which it is founded, he cannot, in most cases, be regarded as insane. If I certify that a patient is confused and disorientated, it means that his perceptions are too disordered to understand what a certificate is; or if I certify that he has delusions, it means that certain of his thoughts, of very real validity to himself, are morbid and that he cannot think healthily. What point is there in showing certificates to such patients? A much more important point is one which anyone with a small knowledge of mental disorder should be able to understand—namely, that in many cases to show a certificate to a patient would be the worst possible treatment and would intensify the symptoms.

It is unhappily the case that bizarre views are often attractive to a very large section of the public, while commonplace facts are uninteresting. This may account for the non-appearance (up to the present date) of any letter in rebuttal. I am, however, sure that the suggestions made will not be acceptable to those of knowledge and experience.—I am, Sir, yours faithfully,

Harley-street, W., March 24th. E. D. MACNAMARA.

To the Editor of THE LANCET.

SIR,—Obviously there is a wide difference of opinion as to the status of certificates of insanity. Dr. R. Eager seems to imply that the "grounds" of certification should be concealed from patients for fear of directing their resentment against the medical men who certified them, and he suggests that this view is general in the profession. Of course, as you pointed out in a leading article, these certificates are not the means of continued detention, and so, perhaps, are not very important, but I cannot believe that a rule of secrecy is justified. It is not feasible to prevent paranoiacs and hypomaniacs from learning who certified them, and concealment of the reasons for certification merely lends colour to their mistrust. The feeling that he is being wrongly, or at least capriciously, dealt with and has therefore no security for future liberation, the lack of confidence in the asylum medical staff, and the lack of insight into his own abnormality, are the three points on which a certified patient is at a disadvantage compared with a voluntary one who seeks treatment from the physician he chooses. Perfect frankness is necessary to overcome these difficulties and to establish a therapeutic relationship with a certified patient. From the purely medical point of view, therefore, no less than from that of public policy, it would seem that the less secrecy the better.—I am, Sir, yours faithfully,

Perth, March 22nd, 1924. IAN D. SUTTIE, M.B.

THE FAMILIAL OCCURRENCE OF ADDISON'S (PERNICIOUS) ANÆMIA.

To the Editor of THE LANCET.

SIR,—In their paper on the Relationship of Some Hæmolytic Disorders to Pernicious Anæmia, published in THE LANCET of March 15th, Drs. P. N. Panton, A. G. Maitland-Jones, and G. Riddoch describe a case of probable pernicious anæmia, in which a history of the disease was obtained in two and, perhaps, three other members of the family, and they refer to other examples of the familial occurrence of the disease recorded by Bartlett, Patch, and Minot. I have been able to collect no less than 40 examples of familial Addison's (pernicious) anæmia from the literature and have met with two similar cases myself. I have also had a patient with subacute combined degeneration of the spinal cord, who eventually die from Addison's anæmia, whose grandfather, father, paternal uncle, and brother died of the anæmia, and another patient with this nervous disorder, associated with achlorhydria but no anæmia, whose grandfather died of Addison's anæmia, and Willson has recorded a similar case.

Two additional examples of familial Addison's anæmia have been described respectively by Faber and Schauman, in which other members of the family had achlorhydria but no anæmia. Among 16 families, of which one member was in Martius's clinic on account of pernicious anæmia and others were given test-meals, complete achlorhydria was discovered in one or more of the healthy members in 11 families. In two out of three patients with normal blood, who were under my care on account of other diseases, in whom a test-meal was given because a relative had died of Addison's anæmia, complete achlorhydria was discovered.

My own cases and those recorded by others do not show that familial cases of Addison's anæmia differ in any way from ordinary cases, as suggested by Panton and his colleagues as a possible explanation of the familial history in their anomalous case of anæmia.

These facts seem to me to be strong evidence in favour of the view that familial pernicious anæmia is a result of familial achlorhydria, which Albu and Jung have shown, and my own experience confirms, may exist quite apart from the occurrence of anæmia in the same family. A comparison between the frequency of achlorhydria in normal adults and the death-rate from Addison's anæmia of the adult population shows that about 1 in 6 of people over 20 with constitutional achylia ultimately develop the anæmia. It is therefore not surprising that more than one member of a family with constitutional achylia should sometimes develop Addison's anæmia, subacute combined degeneration of the cord, or both.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, March 17th, 1924.

To the Editor of THE LANCET.

SIR,—I have read with great interest the important series of cases recorded in your issue of March 15th by Drs. Panton, Maitland-Jones, and Riddoch, but would venture to ask for some more coherent line of approach to the problems which they present. There are now on record quite a large number of curious types of blood disease, of each of which two or three examples have been described, but of which the pathology remains obscure. To these Dr. Panton and his collaborators add, amongst others, the clinical type described in their Group 1. The details given are brief but the syndrome appears to be characterised by a long course, anæmia, jaundice, hæmoglobinuria, thrombosis, and in Case 1 by sepsis and splenomegaly.

It is to the commentary on these cases that I wish to take exception on the grounds that it embodies a false line of approach. It opens with the query, "the question arises as to the category in which these two cases are to be placed," and three possible

categories are discussed. It is surely legitimate to point out that no critical examination of cases can be of value if it presupposes that they must be placed in some already existing category. This difficulty seems to have been apprehended by the authors, for on the next page we find the remark, "for the present we prefer to place the two cases here described in a separate category," but this is, unfortunately, followed by a definite statement on their pathology which lacks, as far as can be seen, any sort of support beyond mere conjecture. This statement is as follows:—

> "The difference, however, between this condition and pernicious anæmia is apparently *one of degree only*, the phases of slow blood destruction responsible for the relapses of pernicious anæmia being accentuated by short sharp bursts of blood destruction in which the quantity of hæmoglobin liberated is so large that it is excreted as such in the urine." (Italics are mine.)

The "slow blood destruction" of pernicious anæmia takes place in the portal system according to Hunter, whose work has not yet been controverted. The products of hæmolysis are accordingly trapped in the liver and iron is there deposited in large amount. It is now suggested that if only that hæmolysis can be shorter and sharper than usual, the products will pass the liver unchanged and be excreted through the kidneys. This seems rather improbable, and it is certainly a novel suggestion. It will also be noticed that the statement quoted assumes that the speed and amount of hæmolysis determine hæmoglobinuria. Most authors have thought that it is the site and not the amount of hæmolysis which matters, and they have given good reasons for their belief. Why are their findings tacitly assumed to be of no value?

The fifth group described in the paper consists of a single case. The commentary commences: "The diagnosis in this case would appear to rest between pernicious anæmia and acholuric jaundice, and if we confine ourselves to these alternatives the evidence favours that of pernicious anæmia." May I suggest that there is no particular reason why a patient who has had his spleen removed for acholuric jaundice and who has a strong family history of this condition should not later suffer from pernicious anæmia? This would appear to be the most obvious explanation of the facts set out, and it is hardly affected by the diagnosis of "pernicious anæmia" in two of his relatives since that term has quite often been applied to acholuric jaundice because of the similarity in the blood pictures.

Finally, I would ask that the term "pernicious anæmia" may be used with some definite meaning, either as applying solely to a particular blood picture (which is not specific to any one clinical condition) or else as applying only to a particular clinical entity (Hunter's, Addisonian or glossitic anæmia) of which the blood picture in question usually forms part. The failure to make this distinction renders valueless a diagnosis of pernicious anæmia alone and this difficulty frequently arises. My own habit is to restrict the unqualified term to the clinical entity, and I believe that this is generally convenient.

I am, Sir, yours faithfully,

Sevenoaks, Kent, March 19th, 1924. GORDON WARD.

DOCTORS AND ADVERTISING.

To the Editor of THE LANCET.

SIR,—My recent essay [1] has brought evidence of very general agreement with the expressed view that intelligent advertisement may be not only proper but even desirable, and that its recognition as advertisement is independent of the question of payment.

Among the interesting comments which have reached me are some which relate to an incidental reference made to the steady State encroachment upon the private practitioner's preserves; and certainly there seems a growing divergence between the material interests of the individual practitioner and of medical bureaucracy in its most intimate form, the municipal health officer. We resolutely bolt and bar the door to a State service but are apt to overlook the activities of the fluent gentleman with the jemmy at the basement window. I, too, share the belief that free anti-venereal treatment is the "thin edge," adroitly chosen as calculated to enlist the sympathy of the well-intentioned but less well-informed, in addition to the customary support from "reformer" and "anti" elements.

I see no possible objection to Dr. Wansey Bayly's suggestion that the names of competent specialists be made more accessible to the public through a special register or the suitable adaptation of an existing publication. Such a list could readily be corrected by the General Medical Council, as a non-partisan tribunal, with whom it would rest to decide whether a proponent's opportunities and experience in a definite branch of practice had been such that he might properly style himself a specialist therein. I take it that Dr. Bayly did not intend to convey that, *training and experience apart*, only those who maintain a hospital connexion are eligible to be described as specialists, for such a restriction would be manifestly unfair, and carries a suggestion of vested right or proprietary interest reminiscent of less enlightened times. It might be susceptible of being so interpreted that those who for reasons of age, health, increasing practice, and so forth, have relinquished hospital connexion cease ipso facto to be specialists. The recent graduate might be eligible for description as a heart specialist, but not so the outstanding figure of contemporary British medicine.

I am, Sir, yours faithfully,

London, March 21st, 1924. H. D. L. SPENCE.

[1] THE LANCET, Feb. 23rd, p. 423.

THE WASSERMANN REACTION IN THE NEW-BORN.

To the Editor of THE LANCET.

SIR,—May I be permitted to make a comment upon your leading article on the Effect of Maternal Syphilis on the Death of the Child appearing on p. 608 of to-day's issue? There is a point with regard to the significance of the Wassermann reaction in the new-born child which, since it appears to have escaped your notice, I have, perhaps, not stated with sufficient clarity in my report to the Medical Research Council.[1] I refer to the fact that in the series of cases re-examined at intervals varying from three weeks to 20 months after birth very striking alterations in the Wassermann reaction were found. While those infants which had been born with a negative reaction remained negative, *the majority (over 90 per cent.) of those born with a positive reaction lost that positive reaction*, even though it was still obtainable in the blood of the mother.

This disappearance of a positive Wassermann in the infant is a phenomenon to which attention was drawn by P. Fildes in a report to the Local Government Board in 1915. As his interpretation of the significance of the Wassermann reaction in the new-born has been very largely overlooked, and, indeed, has been directly traversed by certain writers,[2] I think the confirmation of it in my series of cases is worthy of note. That there is need to emphasise this is demonstrated by the fact that you, Sir, to judge from the second last sentence in your article, appear to regard a record of a positive Wassermann reaction in an infant as a synonym for syphilitic infection.

As I have pointed out on p. 65 of the Report referred to, (*a*) a positive Wassermann reaction in a new-born infant is of no value in diagnosis, and (*b*) the incidence of congenital syphilis is very much less than many purely serological studies have indicated within recent years.

[1] Maternal Syphilis as a Cause of Death of the Fœtus and of the New-born Child. Special Reports, No. 82. H.M. Stationery Office. 1*s.* 6*d.*

[2] S. M. Ross and A. F. Wright: THE LANCET, 1921, *i.*, 962.

The results of the considerable series of post-mortem examinations recorded in the Report not only support these contentions, but also demonstrate that many of the signs supposed to be characteristic of congenital syphilis are quite inconstant in their presence in definitely syphilitic infants, while others are not confined to syphilitic cases. Finally, may I say that the clinical examination of the infants which have been followed up confirms the conclusion that a *positive Wassermann reaction in the child at birth cannot be taken as an indication that the infant is syphilitic.*—I am, Sir, yours faithfully,

Glasgow, March 22nd, 1924. J. N. CRUICKSHANK.

*** We are glad to publish Dr. Cruickshank's letter, since in our leading article it was not possible to take up more than a few of the interesting results obtained from his exhaustive inquiry. The interpretation of the Wassermann reaction in the newly-born is, as Dr. Cruickshank contends, a point around which controversy has centred, and we pointed out earlier in the article to which he refers that he, as well as other workers, have found it to be untrustworthy as an indication of infection.—ED. L.

A CRITICAL EXAMINATION OF PSYCHO-ANALYSIS.

To the Editor of THE LANCET.

SIR,—The review of my book with this title in your issue of Feb. 16th has only just come to my notice. Your reviewer charges me with arguing in a circle. He says: "Many observers have found themselves obliged to assume that mental processes take place without the subject being aware of them, and the author's dismissal of this assumption as being nonsensical is a *petitio principii*, though he tells us that psycho-analysts produce not a shred of proof, only assertions." I do not merely *tell* my readers this, but I give actual examples, where Freud makes an assertion and defends it on the ground of plausibility, and then on the next page calls it a "fact," or says: "as I have shown, or demonstrated, &c." Where, then, is the *petitio principii?* I cannot philosophically disprove the existence of the "unconscious" any more than your reviewer can disprove the existence of a green cow walking on its horns on the other side of the moon, but that does not prove the existence of either the "unconscious" or of the green cow. Wundt, Wm. James, Ziehen, Külpe, and many others have shown that the assumption of an unconscious is quite unnecessary.

If psycho-analysts were to agree that by "unconscious" nothing else is meant than neurone-dispositions there would be little to quarrel about. However, what appears to me far more important, and what psycho-analysts, as well as your reviewer, are most careful to avoid, is the fact that I have shown, I believe conclusively, that their methods of penetrating into the assumed "unconscious" are fallacious. Psycho-analysts always forget the control experiments (vide pp. 95 sq. and 214 sq.). Your reviewer also complains that I mention no references for the statement that "some authorities have pronounced themselves against this method (of reviving the lost memories of painful experiences) in no equivocal manner." I gave, however, an abstract of Pierre Janet's case of Marie which confirms my contention, and Otto Binswanger "Die Hysterie" (Wien, 1904), pp. 908–910, is especially emphatic on this point. After referring to the views of v. Krafft-Ebing, Löwenfeld, and Brodmann, Binswanger concludes: "The revival of old memories has the contrary effect. An emotional storm is unfettered whose consequences are quite incalculable, which not only intensifies symptoms already present, but also produces new ones." I am, Sir, yours faithfully,

A. WOHLGEMUTH.

Shortlands, Kent, March 22nd, 1924.

*** Dr. Wohlgemuth's courteous letter largely confirms the review, while he has, of course, a perfect right to his own opinions.—ED. L.

MEASLES INFECTION: REASONABLE METHODS OF PREVENTION.

To the Editor of THE LANCET.

SIR,—The Sydenham District Medical Society, which is composed of general practitioners mostly of many years' standing, at a recent meeting considered the question of the spread of infectious diseases and came to the following conclusion:—

"There is no evidence of second attacks of measles or of the conveyance of the disease by healthy immune individuals sufficient to justify the existence of a rule forbidding any person from attending school or office from a house in which there is a case of the disease provided satisfactory medical evidence of a previous attack is forthcoming."

This opinion was agreed to unanimously, and I was requested to communicate it to you with the hope that a discussion of the subject by a wider circle might lead to the abolition of rules which are probably unnecessary and often entail considerable hardships on individuals.

I am, Sir, yours faithfully,

H. M. STEWART,
Hon. Secretary, Sydenham District Medical Society.

Dulwich, March 24th, 1924.

TESTS FOR CURE OF GONORRHŒA IN WOMEN.

To the Editor of THE LANCET.

SIR,—I was much interested in the comments of Dr. P. Fildes and Dr. G. T. Western on my paper. Briefly, they state that in some 200 examinations of cultures and smears in women they found 25 per cent. positive in culture, and 20 per cent. in smear. From this they draw the conclusion that cultures are preferable to smears as a routine test.

I am somewhat puzzled as to what exactly the figures quoted by them mean. As my paper was on "Tests for Cure"—and this appears above their letter—it reads as if cases considered clinically cured at the London Hospital, and sent up for a bacteriological test, were found still infected in these proportions. I cannot think Drs. Fildes and Western can possibly mean this; but that, writing with the detachment of bacteriologists when clinical matters are concerned, they are really stating that in some 200 specimens, examined at various stages of the disease, they got the results mentioned. No indication is given as to how many patients these 200 results represent—whether 20 cases examined 10 times, or 200 examined once; nor do they say if the smears were taken in the manner indicated, and with the precautions suggested by me, in the paper criticised. I am still unrepentant in my statement that I have found smears preferable to cultures in testing for the presence of the gonococcus in women.

This statement is the result of the examination of some thousands of women in all stages of the disease, and has been arrived at after a good many years of observation. I have had runs of success with cultures. I have seen runs of failures with smears. A new clinical assistant or house surgeon until drilled often got extremely poor results. I hold no brief for smears taken in any way except as indicated in my papers. I should like Drs. Fildes and Western, therefore, to give smears another trial following that technique.

The whole subject is such a difficult one, the risk of missing the gonococcus, using every known precaution, is still so great, that no method should be neglected which has given success in the hands of others. If Drs. Fildes and Western will examine 1000 women in the manner used by me, and compare the percentage success with cultural results, they may alter their opinion.

I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM.

Harley-street, W., March 21st, 1924.

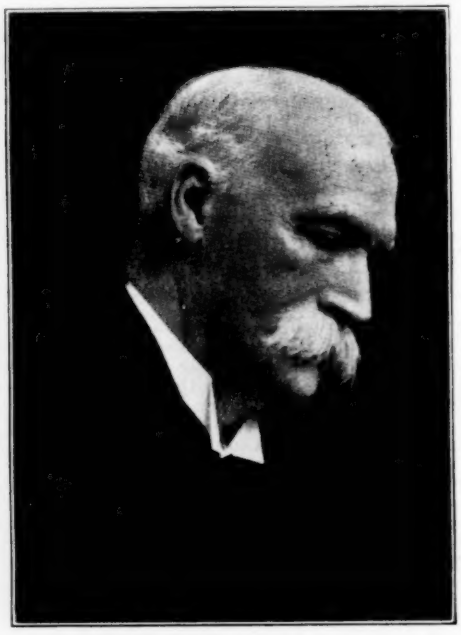
Obituary.

SIR WILLIAM MACEWEN, F.R.C.S. ENG. & IREL., F.R.F.P.S. GLASG., F.R.S., D.C.L., &c., C.B.,

REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

WE much regret to announce the death of the famous surgeon and professional leader, Sir William Macewen, which occurred on Saturday last, March 22nd, at his residence in Glasgow, in his seventy-sixth year.

William Macewen was born on June 22nd, 1848, his father being in the mercantile marine, and at one time master of a yacht, while he was also engaged in commercial undertakings in Rothesay. The great surgeon was the youngest child of a large family and his



SIR WILLIAM MACEWEN.

early life was passed in modest circles. After elementary instruction in Rothesay, he completed his education at the Collegiate School at Glasgow before entering the University. Without obtaining academic honours he worked steadily, and by the time he was of age he had graduated at the University as M.B., C.M. After holding residential appointments, including the house surgeoncy at the Royal Infirmary under Sir George Macleod, he proceeded in 1872 to the M.D. degree, and then for a period he studied at some of the big schools on the continent. Returning to Glasgow he went into private practice and had excellent experience in dispensary work. His chance came when he was elected assistant surgeon to the Royal Infirmary. He had now become an ardent disciple of Listerian principles, perceiving that in every direction they promised untold developments in surgical theory and practice. He had benefited alike by his own practical work and by the excellent training at the University, which enabled him to absorb the lessons and take advantage of the opportunities which the rising science of bacteriology held out. Allan Thompson, Andrew Buchanan, and William Tennant Gairdner were among his teachers, while Lister was engaged in his famous work, first at Glasgow and later at Edinburgh, at the very period when Macewen was inaugurating his great career.

Macewen seems to have been always, though deeply indebted to his training, an independent thinker, and it was during his period of general dispensary practice in Glasgow that he laid the foundation of his clinical knowledge and obtained the resourcefulness that ever marked his practice. His appointment to the Royal Infirmary gave him an opening, which was made wider in a very short period by his becoming in 1877 full surgeon to the institution. This post he held for 15 years, when he succeeded Sir George Macleod, his former teacher, as Regius Professor of Surgery. On the scene of Lister's earliest triumphs—which, it may be added, attracted at first no great attention—Macewen steadily carried out a wonderful work, developing and modifying the antiseptic treatment and becoming a pioneer in particular of brain surgery. The work of Hughlings Jackson and David Ferrier, pre-eminently among others, had brought out the main principles of brain localisation, and Macewen was amongst the first to envisage the possibilities which this knowledge offered under proper application of aseptic methods.

He was probably the first to practise brain surgery in the modern sense of the word, as apart from trephining for injury. In the *Glasgow Medical Journal* of 1879 he published a paper describing how a tumour of the dura mater which had been attended with convulsions was removed after opening the skull with completely satisfactory results. Further contributions followed in THE LANCET on similar work, a paper on monoplegia of the left arm and leg due to cortical lesion forming a good example of his clinical methods; and in 1883 he delivered an address at a meeting in Glasgow of the British Medical Association, taking as his subject the surgery of the brain and spinal cord, which placed him at once in the front rank of surgery throughout the world. The whole subject of brain surgery, as well as his own personal share in its development, was made the subject of his presidential address before the Association in 1922. This contribution to medical science and medical history was published in the *British Medical Journal* and in our own columns, and showed alike how brain surgery had developed pari passu with the efforts of such bold thinkers and expert workers as Ferrier, Horsley, Beevor, Godlee, Gowers, Mott, and Ballance, and how great and independent a place the speaker had himself taken in the work.

Although Macewen's name is mainly associated with brain surgery he was in no sense a specialist, and, as a matter of fact, his earliest work to attract outside attention was in the direction of orthopædics. As early as 1878 a paper was published by him in our columns upon antiseptic osteotomy for genu valgum and genu varum, and other papers followed upon the surgical treatment of osseous deformities and their remedy. He was an innovator in the correction of faulty union of long bones, his method of refracture necessitating a new technique. His success in osteotomies for defective limbs brought about valuable modifications in the operative procedure for various forms of talipes, previously met in an unsatisfactory manner by tenotomies, while his work in bone transplantation was also original, and, both in his hands and as developed in the hands of others, has proved a valuable branch of conservative surgery. A monograph which he published some ten years ago on the development of bones proved the independence and boldness of his views in this province of his science, and the same features marked his work on the surgery of the lung, and the technique which he laid down for dealing with various forms of hernia.

As professor of surgery in Glasgow, Macewen was a great and practical success. He was a man with large views and unsparing of his own time, strength, and money, and he soon got around him brilliant assistants and eager pupils, while honours accumulated thick upon him. Elected a Fellow of the Royal Society, he received honorary Fellowships from the Royal Colleges of Surgeons both in England and in Ireland; he was a D.Sc. of Oxford and Dublin, a D.C.L. of Durham, and an LL.D. of Glasgow and Liverpool. He was elected to the honorary membership of Imperial or Royal Academies and national scientific

societies in France, Germany, Austria, Hungary, Italy, Russia, and the United States, and became President of the International Association of Surgery in 1921. In the following year he was knighted and was elected President of the British Medical Association, being largely responsible for the great success which attended the meeting at Glasgow in that year. He was Honorary Surgeon to the King in Scotland. He received a knighthood in 1902, and was also appointed C.B.

During the war he was one of the first consultants to be appointed by the medical department of the Royal Navy, and was associated from the beginning with the scheme for the establishment of the Home for Limbless Sailors and Soldiers at Erskine. His last journey was undertaken as ambassador of the British Medical Association to the Australasian Medical Congress at Melbourne in November, 1923.

In Macewen the scientific world has lost a great man, who arrived at the head of a learned profession with no extraneous advantages, but by unflinching study and a brave use of unfettered judgment. And his personal appearance coincided exactly with this character. Very tall, handsome, and grave, he commanded without seeking it the immediate attention which philosophers less well endowed physically must struggle to obtain. We reproduce with permission the portrait which appeared in the *British Medical Journal* in October, 1922.

Sir William Macewen married Mary, daughter of Hugh Allan, of Govanhill, by whom he had six children, three daughters and three sons. And it may be mentioned that all the sons entered the medical profession, two being decorated for war work. He was throughout his busy life devoted to the countryside of his birth, and it was a source of real gratification to him when the freedom of the borough of Rothesay was conferred upon him in the courtyard of the ancient castle ruins. In his later years he had purchased a property in Kingarth, where he became a scientific and successful farmer as well as a keen researcher on many biological and veterinary problems. A good example of his fruitful interest in such by-paths was furnished by his study of the antlers of the deer, which was an elaborate essay on bone physiology.

HENRY RUNDLE, F.R.C.S. ENG.

Henry Rundle, consulting surgeon to the Royal Portsmouth Hospital, died on March 19th at Southsea in his eightieth year. Rundle began his medical study as apprentice to the late Mr. W. J. Square, of Plymouth, going on to St. Bartholomew's Hospital, London, whence he became M.R.C.S. Eng. in 1865 and F.R.C.S. in 1870. In the latter year the British Red Cross Society sent out six surgeons to the aid of sick and wounded on either side in the Franco-Prussian War, and Rundle was selected as one of them, proceeding with Mr. W. E. B. Atthill and Mr. J. C. Galton to Berlin first and then to the "Alice" Hospital at Darmstadt, founded under the auspices of Princess Louise of Hesse-Darmstadt (Princess Alice of England), which provided a reserve hospital for the Hessian Division of the Prussian Army. Rundle also served for a time in the neighbourhood of Strasbourg, towards the end of the historic siege of that city, which he entered very shortly after its capitulation. For his services to the wounded of both German and French armies, Rundle received the German War Medal, the Hessian Cross, and also the French War Medal. He was probably the only recipient of both French and German war medals in Europe.

On returning to England after the war Rundle became house surgeon to the Royal Hants County Hospital at Winchester, proceeding thence to Southsea, where he settled down in general practice and commenced his long association with the Royal Portsmouth Hospital, first as assistant surgeon and then as surgeon, retiring in 1908 but remaining in a consulting capacity. His health was latterly feeble and he led a quiet retired life—he was a bachelor—during the last 14 or 15 years, but retained his mental vigour to the end. He was the author of "With the Red Cross in the Franco-German War," and for many years a valued contributor to our columns on matters of local interest.

Of a peculiarly honest, plain-spoken, and kindly disposition, Henry Rundle made firm friendships and won general respect and esteem. The Royal Portsmouth Hospital loses in him a devoted friend.

THOMAS HILL JAMIESON, M.D., M.R.C.P. EDIN.

Dr. T. H. Jamieson, Deputy Commissioner of Medical Services in Tropical Disease under the Ministry of Pensions, whose death occurred recently in London at the age of 50, was a graduate of the University of Edinburgh, where he qualified M.B., C.M. in 1894, and there later he gained the degree of M.D. He also was admitted a Member of the Royal College of Physicians of Edinburgh in 1915. After holding his first appointments as house surgeon to the Huddersfield Infirmary and then to the Children's Hospital, Liverpool, he went to the Far East and settled in Penang, Straits Settlements, where he built up an extensive practice. After many years of strenuous work in the tropics his health began to fail, and he finally returned to England in 1917. He was rejected for service abroad, but was appointed to the Fourth London General Hospital R.A.M.C.(T.) as specialist in malaria and other tropical diseases. In 1919, having obtained the D.P.H. London, he joined the medical staff of the Ministry of Pensions, where, in virtue of his special knowledge of tropical disease, he held the appointment of deputy commissioner with administrative charge of the tropical clinics in the S.E. region. Later he became visiting physician to the Ministry's Hospital at Orpington, Kent, and to Queen's Hospital, Sidcup. For his services he gained the honour of M.B.E.

A friend on the Pensions medical staff writes:—

"Dr. Jamieson was outstanding in his clinical judgment and acumen, and enthusiastic in all his work. By his unfailing courtesy and kindness he won the confidence of colleagues, staff, and patients, many of whom at their own request attended his funeral service at Golders Green. His broad sympathies and wide outlook on the problems of the day, with all the political questions so immediately affecting national life, made him a companion to be sought and prized. Politically he inclined to many of the aspirations of the Labour Party."

To his widow we extend our sincere sympathy.

HERBERT LEYLAND SACKETT, M.B., B.S. LOND., F.R.C.S. ENG.

Mr. H. L. Sackett, clinical assistant, St. Bartholomew's Hospital, died on March 21st after a very brief illness, at the age of 30. Vigorously pursuing his surgical work until midnight on March 13th, he complained of feeling very ill and had a rigor. It was then discovered that one thumb was inflamed. Treatment was immediately carried out, but despite all efforts the trail of septicæmic symptoms followed. The tragedy was heightened by the fact that in another ward of the hospital lay his father, the Rev. Walter Sackett, suffering from erysipelas. Father and son died within a few hours of each other. As a boy Mr. Sackett suffered from spinal trouble and for months laid recumbent. During this time his ever active mind was gleaning lore of every kind. His years at St. Bartholomew's were years of triumph. As a student he won the Bentley prize; he became a house surgeon, and later intern midwifery assistant. Last year he gained his F.R.C.S., obtained a research scholarship, and has been engaged for many months in original work on intestinal obstruction. In January of this year he was appointed a surgical clinical assistant. He was for more than two years editor of *St. Bartholomew's Hospital Journal*, and as a student was President of the Christian Union.

Mr. Sackett was not only a surgeon of great promise, but a man of the highest type. His kindness endeared him to his patients, and his amazing thoroughness and devotion to duty caused him to be deeply respected by all who came in touch with him.

Medical News.

UNIVERSITY OF OXFORD: *Radcliffe Travelling Fellowship.*—The Master and Fellows of University College announce that the trustees have elected Charles Frederick Terence East, M.A., B.M., B.Ch., M.R.C.P., New College and King's College Hospital, to a Radcliffe Travelling Fellowship of £300 for two years.

The following degrees in medicine have recently been conferred:—

Doctor of Medicine.—S. C. Dyke and J. J. Conybeare.
Bachelor of Medicine.—H. A. Robertson, E. B. Strauss, Jean Orr-Ewing, B. G. Scholefield, and R. V. Facey.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part I.—M. M. F. Arthur, Ethel Barrow, E. I. Bieber, H. M. Boston, G. E. Church, N. L. Corkill, O. Dawood, J. L. Donnelly, F. R. Faux, Dorothy A. Gough, J. Graham, R. I. Greenshields, J. Hatton, E. Hughes (with distinction), F. P. Irvine, D. Katz, B. Kay, J. E. S. Lloyd, W. J. Lloyd, H. McGrath, Isabel McKee, D. J. T. Magowan, D. Roberts, J. Tarshish, I. Thomas, and J. E. Walker.

Part II.—T. A. Clarke, N. J. Crawford, H. L. Cullen, I. Gordon, A. J. Goss, Catherine E. I. Greenshields, Sarah Leigh, G. W. Paton, F. B. Shevlin, and B. J. S. de Villiers.

DIPLOMA IN PUBLIC HEALTH.

A. C. Crawford and Mary A. Thomas.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

J. D. Ingram, J. S. Kellett-Smith, W. J. MacHugh, H. Miller, and R. E. Sadleir.

UNIVERSITY OF DURHAM: *Faculty of Medicine.*—At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR LICENCE IN DENTAL SURGERY.

Anatomy, Physiology, and Histology; Dental Anatomy, Dental Histology, and Dental Materia Medica.—Thomas E. Coulson, Lionel G. Dewar, Wilfred A. Gale, Frederick J. Gilbertson, Wilton L. Milburn, Robert Moody, and Norman Wilkinson.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—A. Kotbi, St. Mary's Hospital, and D. G. Robinson, Guy's and Charing Cross Hospitals.
Medicine.—F. H. Armanious, St. Thomas's Hospital; M. K. El Khadem, Liverpool; and W. H. G. M. Ling, Edinburgh and St. Mary's Hospital.
Forensic Medicine.—E. J. Creais, St. Mary's Hospital; C. E. Donaldson, Cambridge and St. Mary's Hospital; R. D. Jones, Edinburgh and Middlesex Hospital; W. H. G. M. Ling, Edinburgh and St. Mary's Hospital; J. P. McGuire, St. Mary's Hospital; J. G. E. Vachell, Cambridge and St. George's Hospital; and A. J. Vickery, St. Mary's Hospital.
Midwifery.—W. B. Arnold and J. O. W. Bland, St. George's Hospital; W. H. G. M. Ling, Edinburgh and St. Mary's Hospital; and J. G. E. Vachell, Cambridge and St. George's Hospital.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: M. K. El Khadem, W. H. G. M. Ling, and A. J. Vickery.

BRITISH MEDICAL ASSOCIATION: SCHOLARSHIPS AND GRANTS.—The Council of the British Medical Association is prepared to receive applications for *Research Scholarships* as follows:

1. An Ernest Hart Memorial Scholarship of the value of £200 per annum, for the study of some subject in the department of State medicine.

2. Three Research Scholarships, each of the value of £150 per annum, for research into some subject relating to the causation, prevention, or treatment of disease.

Each scholarship is tenable for one year, commencing on Oct. 1st, 1924. A scholar may be re-appointed for not more than two additional terms, and may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment do not interfere with his work as a scholar.

Grants.—The Council is also prepared to receive applications for grants for the assistance of research into the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

Applications for scholarships and grants should be made not later than June 7th. Applicants are required to furnish the names of three referees competent to speak as to their capacity. The conditions are fully stated in the regulations, a copy of which will be supplied on application to the Medical Secretary of the Association, 429, Strand, London, W.C. 2.

HARNETT *v.* BOND AND ADAM.—The date of the hearing of the appeal in this case has been postponed until April 7th.

THE Cambridge University Press will shortly publish a reprint, in its original form, of Sir Michael Foster's "Lectures on the History of Physiology during the Sixteenth, Seventeenth, and Eighteenth Centuries," which has been out of print since 1922.

QUEEN'S UNIVERSITY (BELFAST) CLUB, LONDON.—A dinner will be held in the Connaught Rooms, Great Queen-street, London, W.C. 2, on Thursday, April 10th, at 7.30 for 8 o'clock. Prof. Thomas Sinclair, President of the Club, will take the chair. The charge for the dinner will be 12*s.* 6*d.*, inclusive of gratuities but exclusive of wines, which sum will be collected during the evening. Old students intending to be present are requested to notify the hon. secretaries at 152, Harley-street, London, W., to this effect not later than April 7th.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—The members' congress will be held from April 3rd–5th. On April 3rd, at 11 A.M., Professor Winifred Cullis will lecture on Internal Secretions: Integration of the Body by Chemical Agencies, and at 6 P.M. Miss A. M. Hallam will lecture on Psychology in Every-day Life, at the Wigmore Hall, Wigmore-street, London, W. 1. At 3 P.M. representative work in the various departments of Chelsea College of Physical Education will be shown to members. On April 4th, at 10.30 A.M., demonstrations of treatments will be given in the Botanical Theatre, University College, Gower-street, London, W.C. 1. At 2.30 P.M. a lecture-demonstration on patients under treatment will be given by Mr. W. H. Trethowan in the Physiological Theatre, Guy's Hospital, S.E. 1, and at 6 P.M. Mr. L. E. Barrington-Ward, F.R.C.S., will lecture on Pseudo-paralysis in Children at the Wigmore Hall. On April 5th, at 11 A.M., Dr. J. B. Mennell will speak on Post-maternity Work, also at the Wigmore Hall. The annual meeting of the Society will be held on April 5th, at 2.30 P.M., at the Court House Restaurant, 1, Marylebone-lane, Oxford-street, W. 1.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The tenth annual conference will be held in London on July 3rd and 4th. The main subject under consideration will be the Part Played by Training Colonies in the Treatment of Tuberculosis, and the conference will take the form of a practical demonstration of the work carried out at the training colony, founded and maintained by the National Association at Burrow Hill, Frimley. This colony is included in the scheme of the Ministry of Pensions, and has 60 places for the treatment and training of tuberculous ex-Service men who have already received sanatorium treatment. The courses of training comprise: (*a*) carpentry, (*b*) market gardening, poultry, pig and bee keeping, including light farm work. There is also a sanatorium block of 20 additional beds. Arrangements will be made for the conveyance of members of the conference from London to the colony. After the demonstration a discussion will be opened by Dr. A. H. Macpherson, and the discussion will be continued on July 4th at the Robert Barnes Hall, 1, Wimpole-street, London, W. 1. Further particulars may be obtained from the Secretary of the Association, at 20, Hanover-square, London, W. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The London Temperance Hospital, Hampstead-road, as previously announced, is giving a two weeks' intensive course from Monday, March 31st, to Saturday, April 12th, consisting of practical demonstrations each morning from 10.15 to 12.15, and in the afternoon from 2 to 4 P.M. ward rounds and out-patient clinic. Lectures, open to members of the profession, will be given daily at 4.30 P.M., the first being given by Sir Humphry Rolleston on March 31st on Jaundice. Other lecturers for the week are: Dr. Porter Parkinson, Heart Disease in Children; Mr. Herbert Paterson, Surgical Treatment of Dyspepsia; Dr. David Somerville, Gastro-enterology (I.); and Mr. Lawson Whale, Otorrhœa and its Treatment. Special demonstrations will be given on Fevers on Thursday morning at the North-Western Fever Hospital, on Mental Diseases at Bethlem Royal Hospital on Saturday morning, and in Ophthalmology at the Royal Westminster Ophthalmic Hospital in the afternoon. Beginning on March 31st a three weeks' course in Ophthalmology will be held at the Royal Westminster Ophthalmic Hospital. Clinical instruction will be given every afternoon from 2 P.M., and special demonstrations in medical ophthalmology and methods of examination will be given on Tuesdays and Thursdays. Copies of the syllabus with further information as to the above courses can be obtained from the Secretary to the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

WELFARE OF THE DEAF.—An important conference of representatives of schools and missions interested in the welfare of the deaf was held under the presidency of Lord Charnwood at the Kingsway Hall, London, on March 19th. Resolutions were passed emphasising the need for the reconstitution of the National Bureau for Promoting the General Welfare of the Deaf on broader lines, so that the claims of the deaf might be authoritatively expressed and nationally met as have been those of the blind, and suggesting that the name of the bureau be changed to the National Institute for the Deaf. Lord Charnwood pointed out the need, in the interests of the general community as well as of the deaf themselves, of some central body which could voice the requirements of the deaf. Mr. A. J. Story called attention to the neglect by the State of the deaf who, he said, were worse off than the blind, for nothing was done for them after the age of 16. A central body should be able to apply pressure on the Government. Mr. T. Mardy Jones, M.P., who said that his interest in the deaf had been stimulated as a result of the conference, advocated the formation of a Parliamentary group in the House of Commons, when ways and means would soon be found of doing something substantial for the deaf. It was announced that both the Prime Minister and the Minister of Health had expressed their sympathy in the conference. Dr. A. Eichholz was present as representing Mr. Wheatley. A conference to draw up a new constitution will be convened at a later date.

TUNBRIDGE WELLS GENERAL HOSPITAL. — The fund earmarked for the purpose of extending this hospital now stands at £8000, and it was announced at the recent annual meeting of the governors that when the figure reached £10,000 plans would be considered. The need for provision for paying patients was emphasised, and an appeal was made for a speedy realisation of the sum needed. During 1923 the number of in-patients constituted a record—viz., 1304, including 525 women, 519 men, and 260 children, a total of 124 in excess of the previous year. The out-patients numbered 4765, an increase of 334 over 1922. The theatre operations totalled 705, and in addition 445 operations were performed in the out-patients' department under a general anæsthetic. There were also 404 dental cases, 24,197 treatments in the electrical department, and 1211 X ray diagnosis and screen examinations. The governors intimated that they had decided to improve and to add to the equipment of the electrical department at a cost of nearly £500, the X ray apparatus to be so improved that treatment for certain cases of cancer would be possible; and that a new expense had been incurred by the insulin treatment for diabetes. The total income amounted to £12,794 17*s.* 6*d.*, and the expenditure £12,990 2*s.* 5*d.*, the excess of expenditure over income being £194 5*s.* 11*d.* It was pointed out that under the conditions now existing an income of £13,000 per annum was needed to run the hospital efficiently. The patients treated during 1923 represented no fewer than 87 towns and villages.

THE SCHICK TEST AT BRIGHTON.—At a sessional meeting of the Royal Sanitary Institute held on March 14th Dr. Duncan Forbes read a paper on the Schick Test and Immunisation against Diphtheria. He mentioned that during the last 23 years there were 5500 cases of diphtheria and 350 deaths in Brighton. Most of the cases occurred between the ages of 5 and 10 years, and most of the deaths also occurred at that time. While the health services could do much in preventing the spread of the disease in families, in residential schools, and, more doubtfully, in day schools, they had been able to do little to prevent the occurrence of epidemics, and it was, therefore, necessary to look for some new means of combating the disease. The most hopeful of recent discoveries was, Dr. Forbes considered, immunisation by toxin-antitoxin. The first task was to discover who were susceptible and who were not susceptible, and this, Dr. Forbes said, could be foretold in many cases by a careful study of the reaction of the Schick test, and steps taken to prevent any great reaction. The cost of testing 50 children with the Schick test worked out at 12*s.* 6*d.*, and to give protection to one child with toxin-antitoxin cost 3*s.* apart from the doctor's time. It would, therefore, Dr. Forbes declared, cost some £300 each year to immunise all Brighton's 2000 one-year-olds, but the cost of such immunisation would be balanced by the saving of over ten lives each year and by all the money that would be saved from nursing in hospital and at home through rather serious illnesses, so that economically it was well worth while immunising even small numbers of children. In Brighton free immunisation was offered to children in the residential institutions, and any mother applying at an infant welfare centre could have her children immunised free of charge. The nurses at the fever hospital, particularly the probationers, were now protected against the disease. Dr. A. Greenwood disagreed with a suggestion by Dr. Forbes, that in applying the Schick test it should not be necessary to consult the parents of the children to be treated, and expressed the opinion that if the parents objected it was possible that an action for assault might lie against the doctor. Dr. Greenwood spoke of the difficulties in carrying out medical inspection of secondary school scholars owing to the objection of parents, and felt sure a vigorous opposition would follow in the case of the Schick test.—Dr. F. C. Linton, Dr. H. P. Newsholme, and Dr. Hugh Stott also took part in the discussion.

Mr. H. D. Gillies is proceeding on the invitation of the Danish Government to Copenhagen for the purpose of treating by prosthesis, or in accordance with their condition, the officers and men who were wounded by the explosion on the Danish cruiser *Geyser* last summer.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of the subscribers of this Fund will be held at 11.30 A.M. on April 25th, at the Medical Department of the Navy, 68, Victoria-street, S.W. 1, to elect six directors of the Fund.

THE LATE DR. R. FITZMAURICE. — Dr. Richard Fitzmaurice, who died at Littlehampton on March 11th, aged 72, had lived in retirement since 1909, in which year he completed a quarter of a century's work as medical officer and public vaccinator in the Lindfield district of the Cuckfield Union in Sussex. He was educated at Queen's College, Cork, and the University of Edinburgh, where he qualified L.R.C.P., L.R.C.S. in 1884, and in the same year went to reside at Lindfield. Dr. Fitzmaurice was a laughter-loving Irishman, and the poor folk who formed the main bulk of his patients found in him not only a kindly parish doctor but a real friend.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

National Health Insurance (Cost of Medical Benefit) Bill.

An explanatory memorandum issued with this Bill reads as follows:—

The object of this Bill is to provide the moneys required to meet the balance of the cost of medical benefit and administration beyond the sums provided by s. 7 of the National Health Insurance Act, 1920. For the period from the 1st April, 1922, to the 31st December, 1923, this balance was provided mainly out of the funds of approved societies in accordance with the provisions of the National Health Insurance Act, 1922.

	s.	*d.*
The total cost of medical benefit in England from 1st January, 1924, including doctors' capitation fee, cost of drugs, doctors' travelling allowances, and certain other minor items will be (per insured person per annum)	11	10½
Towards this there is provided from funds of the approved societies by s. 7 of the National Health Insurance Act, 1920, a sum of (per insured person per annum)	9	6
Leaving a balance of (per insured person per annum)	2	4½

Clause 1 (1) (*a*) and (*b*) provide for the payment of this balance for the three years 1924 to 1926.

Clause 1 (2) provides that this balance is to be found from the following sources:—

	s.	*d.*
(*a*) Out of the funds of approved societies, &c. ..	0	2
(*b*) Out of moneys in the Central Fund derived from the unclaimed balance of sums received from the sale of National Health Insurance Stamps ..	1	8½
(*c*) Out of the interest earned on the proportion of insurance funds retained in the National Health Insurance Fund (Investment) Account beyond the prescribed rate (4½ per cent.) credited on moneys standing in that Account	0	6
	2	4½

Under section 3 of the National Insurance Act, 1911, two-ninths of the above sums are payable out of moneys provided by Parliament, the remaining seven-ninths being derived from the contributions out of which the above funds are made up.

Clause 2 provides for the payment into the Central Fund of a further sum of £100,000 from the unclaimed balance in the Stamps Sales Account over and above the proportion of that balance which is normally paid into that fund. This is required in order to enable the sums under Clause 1 (2) (*b*) to be met out of the Central Fund.

Clause 3 re-enacts, as from 1st January, 1923, to 31st December, 1925, the provisions of section 3 of the National Health Insurance Act, 1922, which lapsed on 31st December, 1922, and under which assistance was given to approved societies from the unclaimed balance in the Stamps Sales Account to enable them to pay benefits to members who would otherwise have been suspended from benefit by reason of arrears due to prolonged unemployment.

Clause 4 provides for a corresponding payment to the Ministry of Labour for Northern Ireland out of the Central Fund, which is an international fund common to England, Scotland, Wales and Northern Ireland.

Clause 5 applies the Bill to Scotland and Wales with such modifications as are required in consequence of a difference in the cost of drugs, doctors' travelling allowances, and other minor items in those countries.

The total amounts to be provided in each year for the whole of Great Britain from the various sources under clauses 1 (2) and 5 (including the statutory grant of two-ninths from the Exchequer) are as follows:—

	£
(*a*) Out of the funds of approved societies, &c. ..	118,000
(*b*) Out of moneys in the Central Fund	1,266,000
(*c*) Out of interest income	378,000
	1,762,000

HOUSE OF LORDS.

TUESDAY, MARCH 25TH.

Dogs as a Subject of Medical Research.

Lord BANBURY moved the second reading of the Dogs' Protection Bill, having for its object the exemption of dogs from scientific experiments; in the course of his words he claimed THE LANCET as upholding the statement that dogs were not necessary for experiment. Lord KNUTSFORD moved the rejection of the Bill in an amusing speech in which he prophesied that other peers, especially interested in other animals, might make similar efforts for their exemption. Speaking of the ravages of distemper, Lord KNUTSFORD said that the Bill would stop all research on the subject, and that if dogs could speak he doubted whether they would seek the suggested exemption. Lord LAMBOURNE supported the Bill, when Lord MILDMAY, one of the three lay members of the Medical Research Council, opposed the measure in an excellent speech, in which he informed the House how research for organisms connected, for example, with distemper, foot-and-mouth disease, and swine fever, would be affected by the proposed restriction. Lord RAYLEIGH spoke against the Bill as setting up an obstacle in the way of those who were seeking to penetrate the secrets of disease; and the LORD CHANCELLOR announced that the Government would not favour the measure. Lord CURZON stated that experiments upon dogs had led to incalculable benefits in recent years, in regard particularly to discoveries in connexion with diabetes and rickets; while Lord PARMOOR announced that at the Medical Research Council inquiries were taking place into distemper, in which hopeful progress had been made.

The motion for the second reading of the Bill was rejected without a division.

HOUSE OF COMMONS.

TUESDAY, MARCH 18TH.

Medical Boards and Ex-Service Men.

Mr. FREDERICK GOULD asked the Minister of Pensions whether, in view of the dissatisfaction existing amongst ex-Service men arising from the under-assessment of their disability at the hands of medical boards, he would issue on behalf of his department a circular requesting a more sympathetic and even generous consideration of the cases coming before them for examination.—Mr. F. O. ROBERTS replied: I have no reason to believe that the assessments given by medical boards do not represent a fair and impartial judgment on the conditions of the disability as found on examination. On assuming office as Minister of Pensions I issued a communication to all Members of the Ministry Staff, including members of medical boards, reminding them that the work of the department should invariably be carried out in a spirit of the utmost consideration and sympathy.

WEDNESDAY, MARCH 19TH.

Stone-dusting and Health of Miners.

Mr. CHARLES EDWARDS asked the Secretary for Mines whether he had received complaints of the effects of stone-dusting on the health of miners; whether he was aware that there was no obligation on colliery owners to remove dust, but only to see that a certain proportion of stone-dust was maintained, and, consequently, instead of removing coal-dust stone-dust was constantly added, making travelling on haulage roads not only a nuisance but highly injurious to the health of the workpeople who had to use them; and whether he would request the committee now inquiring into the effects of stone-dust to go down some mine during working hours and whilst the roads were actually being used, so as to enable them to form an intelligent opinion of the magnitude of the evil and the necessity of discontinuing the same.—Mr. SHINWELL replied: I have received some such complaints, though they are rare. I think that my hon. friend has overlooked Section 6 of the General Regulations of July 30th, 1920, which requires that the floor of every travelling road shall be cleared of dust at regular intervals of time. There need be no fear that a committee, which includes Dr. Haldane and Dr. Collis, is without first-hand experience of working conditions underground.

Lead Poisoning in China and Earthenware Trades.

Lord HENRY CAVENDISH-BENTINCK asked the Home Secretary the number of cases of lead poisoning, and the number of fatal cases, in the china and earthenware trades during 1923, and also during January and February, 1924.—Mr. HENDERSON replied: The following are the particulars asked for:—

	1923.		January and February, 1924.	
	Total No. of cases.	No. of deaths.	Total No. of cases.	No. of deaths.
China and earthenware trades	44	11	8	2
Shipbreaking	38	—	29	1
Electric accumulators	95	2	18	—

THURSDAY, MARCH 20TH.

The House went into Committee of Supply on the

Navy Estimates for 1924–25.

Dr. SPERO said the efficiency of the navy primarily depended upon the health of the Service. From the statement issued by the First Lord of the Admiralty one would imagine that all was well with the Naval Medical Service. He hardly made any reference at all to the Service except to say that the number of medical establishments had been reduced by two—namely, that the Yokohama Hospital was destroyed in the earthquake and the Royal Marine Infirmary was closed down owing to the transfer of the Royal Marine Division. Yet there was a shortage of medical officers in the Service, and at the present moment the Admiralty could not man all the ships with medical officers if they were sent to sea. This was a very serious position which called for immediate inquiry. At the end of January the shortage of medical officers was 39 below the complement required to maintain an efficient service. More men were retiring than entering the Service. The cause of the state of things was that the Admiralty had broken faith with their medical officers. As a result of the new regulations which came into force on Jan. 1st, 1920, medical officers who joined the Service under the distinct understanding that they would be retired at the age of 55, unless previously promoted, were compulsorily retired at the age of 50 without any compensation whatever. Moreover, the retirement was retrospective. The actual monetary loss to each medical officer in five years was £2200. The breach of faith affected junior as well as senior officers. He maintained that it was not from the medical officer's point of view a lucrative Service; in fact, it was a very precarious Service to enter and one that he quite agreed with the British Medical Association was not one which they could recommend young doctors to enter. The British Medical Association repeatedly brought the facts before the Admiralty, but the Admiralty seemed to think that there would be plenty of new candidates forthcoming when the output in the medical schools was at its height. But they had been very much disappointed. He would suggest one or two ways to induce young medical officers just leaving hospital to enter the Service. Remuneration must be the first consideration. A surgeon-lieutenant in the Royal Navy received £438 a year. A lieutenant joining the Royal Army Medical Corps got £555 a year. A married surgeon-lieutenant joining the R.A.M.C. got £617 a year, but a married officer joining the navy got only £438 a year. Perhaps the Admiralty believed in birth control; it looked like it. Again, supposing a medical officer was sent abroad—to China, for example. The Admiralty made no allowance to bring out his wife and family to him. Another reason why medical men would not join the Service was because of the want of opportunities for study. He suggested that the Admiralty should give more frequent opportunities for post-graduate study. There was such a scheme in connexion with the army. In the case of a court-martial the medical officer was the only officer on board who was not allowed to sit on the court even if one of his assistants was up for trial. The Naval Medical Officers' Department was on the top floor of an ordinary block of offices in Victoria-street. The Admiralty had made the medical service a thing apart, and as an old medical officer in the navy he felt that medical men on the whole were not being treated fairly.

Viscount CURZON said that Dr. Spero was perfectly right in saying that the shortage of medical officers in the navy was a very serious problem and it was one to which he (Lord Curzon) would ask the Admiralty to give their serious attention.

Mr. AMMON, Parliamentary Secretary to the Admiralty, replying to the debate, said that he gathered that Dr. Spero had spoken with the support of the medical profession generally as well as that of members of that profession in

the House of Commons. The hon. Member was probably not aware that a deputation from the British Medical Association had been received by the Admiralty on the point and the arguments of his speech were a recapitulation of the points put forward by the deputation. The whole matter was being gone into, and he hoped to reply to the deputation before long. But he ought to say this: The naval pay is £130 a year cash, while the army pay is less. The naval medical officer is also given lodgings and rations.

Lunacy Laws Inquiry.

Mr. ROBERT MORRISON asked the Prime Minister whether, when setting up the proposed body to inquire into the present lunacy laws and their administration, the terms of reference would be made wide enough to include an inquiry into the mental deficiency laws.—Mr. WHEATLEY replied: No, Sir, it is not proposed that the inquiry should extend to the mental deficiency laws. These form a separate and distinct subject-matter, the inclusion of which would, in my opinion, unduly delay the report and recommendations of the inquiry committee upon the more urgent question.

Overcrowded Maternity Wards in Hospitals.

Commander BELLAIRS asked the Minister of Health, in view of the prevalent overcrowding and the resulting increased need of maternity wards at hospitals, what assistance the Government would give in regard to capital expenditure and annual outlay so as to enable welfare centres, borough councils, and hospital committees to prepare schemes at once.—Mr. WHEATLEY replied: I am ready to give sympathetic consideration to proposals for the provision of maternity beds in areas where there is need for additional accommodation, and to pay grants not exceeding 50 per cent. of approved capital and annual maintenance expenditure. The grant in aid of capital expenditure usually takes the form of an annual payment based on the sum required for interest on and repayment of capital within a fixed period.

Medical Women on Lunacy Inquiry.

Mrs. WINTRINGHAM asked the Minister of Health whether, when appointing the committee of inquiry into the lunacy laws, he would include two women, one of the medical profession and one with special and practical knowledge of asylums visiting committees.—Mr. WHEATLEY replied: The hon. Member's suggestion will be carefully considered, but I cannot at present give any undertaking on this point.

Tubercle-infected Milk.

Sir HERBERT NIELD asked the Minister of Health whether he had received a series of resolutions with regard to the inadequate existing legislation with reference to tubercle-infected milk and the Milk and Dairies (Consolidation) Act, 1915; and whether he could see his way to put in operation without further delay the Tuberculosis Order of 1914, and also to introduce legislation to ensure the prevention of tubercle-infected milk being distributed and infected animals being slaughtered.—Mr. WHEATLEY replied: The answer to the first part of the question is "Yes." As regards the second part, I understand that my right hon. friend, the Minister for Agriculture, is considering the question of the reintroduction of the Tuberculosis Order. The hon. Member will be aware that the coming into operation of the Act of 1915 has been postponed by the Milk and Dairies (Amendment) Act of 1922 until Sept. 1st, 1925, and I do not think it will be practicable to introduce other legislation on this subject during the present session.

Dried Milk Regulations.

Mr. GILBERT asked the Minister of Health whether, as the final conference between the Health Department and the representatives of the dried milk trade only took place on Jan. 24th last, and in view of the time required for printing the large stocks of tins, &c., required to comply with the Order, he would postpone the date, May 1st, for the operation of the Public Health (Dried Milk) Regulations to enable the trade to clear the market of outstanding stock and so avoid the unnecessarily heavy loss that would otherwise be incurred.—Mr. WHEATLEY replied: The Public Health (Dried Milk) Regulations were made on Nov. 5th, 1923, to come into operation on May 1st, 1924. The regulations were published in draft on July 24th, 1923, and the representations of the trade were considered, and met, as far as possible, before the regulations were made. I am satisfied that the trade had ample notice of the provisions of the regulations and I see no reason for postponing their operation.

Tubercle-infected Cattle.

Mr. BARNES asked the Minister of Agriculture whether he had received representations from local authorities urging the necessity for legislation to eliminate tubercle-infected cattle from the dairy herds in this country in the interests of public health; and whether he could hold out any promise of early legislation.—Mr. SMITH replied: The answer to the first part is in the affirmative. The matter is being carefully and sympathetically explored, but I am not yet in a position to make any statement on the subject.

MONDAY, MARCH 24TH.

Vaccination Act.

Mr. BLACK asked the Minister of Health the cost of administering the Vaccination Act, 1907, in Great Britain for the last year with respect to the remuneration of vaccination officers; the cost of providing the exemption certificate forms, and any other expenses involved; and how much of the cost fell upon the taxpayer and how much upon the ratepayer.—Mr. WHEATLEY replied: It is not possible to state separately the expenditure incurred on the remuneration of vaccination officers. The total expenditure of boards of guardians on public vaccination for the year ending March 31st, 1922 (the last year for which complete figures are available), was £162,400, the whole of which was defrayed out of local rates. During the same year the sum paid to public vaccinators out of the Exchequer contribution accounts of the local authorities amounted to £10,200, while the approximate cost to the Exchequer of vaccine lymph supplied to public vaccinators and medical officers of health was £11,800. The cost of printing the new form of declaration of conscientious objection has been £67 up to date.

Prison Discipline.

Mr. HAYES asked the Home Secretary whether, in view of the fact that at Parkhurst Prison the medical officers and the registered nurses were experienced in prison discipline, the question would be considered of ceasing to furnish them with truncheons and handcuffs; and why the hospital principal was not relieved by a member of the hospital staff instead of by a discipline principal.—Mr. HENDERSON replied: The hospital officers, like other officers at Parkhurst, carry staves as a part of their ordinary equipment. They have never been used, and the necessity for requiring the officers to wear them when within the hospital is being considered by the Prison Commissioners. Handcuffs are only used for purposes of escort to another prison. The hospital principal officer is relieved by a discipline principal officer pending the transfer of another hospital principal officer from another prison.

Panel Practitioners' Fees.

Sir KINGSLEY WOOD asked the Minister of Health whether he was now in a position to make a statement relating to his proposals concerning the payment of medical men on the panel lists.—Mr. GREENWOOD, Under Secretary to the Ministry of Health, replied: The Government proposals in regard to the matter referred to by the hon. Member are embodied in a Bill which is being introduced to-day.

National Health Insurance Bill.

Later Mr. WHEATLEY introduced the National Health Insurance (Cost of Medical Benefit) Bill, the object of which is "to make further provision with respect to the cost of medical benefit and to the expenses of the administration of benefits under the Acts relating to National Health Insurance, and to amend Section 29 of the National Health Insurance Act, 1918; and for purposes connected therewith." The Bill was read a first time.

Consumption Among Convicts.

Mr. SOMERVILLE HASTINGS asked the Home Secretary whether he could state the percentage of convicts, male and female, who had developed pulmonary consumption during the last five years.—Mr. RHYS DAVIES, Parliamentary Secretary to the Home Office, replied: There were only four cases of pulmonary consumption among male convicts, giving a percentage of 0·16 of the total receptions for the past five years. There were no cases among female convicts.

R.A.M.C. Lieutenants.

Lieut.-Colonel POWNALL asked the Secretary of State for War what was the number of lieutenants in the Royal Army Medical Corps and what was the normal establishment for this rank.—Major ATTLEE replied: The number of lieutenants in the Royal Army Medical Corps is 14, of whom three are seconded. There is no fixed establishment for this rank.

During the debate on the Army Estimates, Lieut.-Colonel POWNALL said that the R.A.M.C. had practically stopped getting fresh recruits of officer rank. The February army list showed seven lieutenants in the whole of the corps, and the majority of these were on probation. In view of the fact that the establishment was some hundreds, there was obviously something very much at fault with the methods of recruiting. He asked the War Office what steps were being taken to secure a reasonable supply of young officers for the corps. The whole health of the army was involved and the question was a most serious one. Unless recruits were forthcoming they would soon find themselves with a corps consisting only of majors and lieut.-colonels.

TUESDAY, MARCH 25TH.

Nil Disability.

Mr. HUTCHISON asked the Minister of Pensions if his attention had been drawn to what was termed "nil disability"; whether he was aware that, when the man's panel doctor certified the man to be suffering from disability, if the medical board decided "nil disability" no right of appeal was allowed against that decision; and would he take steps to allow the right of appeal.—Mr. J. W. MUIR replied: I am not quite clear what class of case the hon. Member has in mind. In cases where the medical board find that there is no appreciable degree of disablement, the award given is one of "nil disablement," and the man concerned has a right of appeal thereon to the assessment appeal tribunal or to a medical appeal board, according as the award is or is not declared a final award. Exceptionally a case has occurred in which the medical board are wholly unable to discover that the claimant has the disability or ailment claimed at all. Where such cases have arisen it has been arranged that the man's appeal should go forward if he desires to appeal. General instructions are being issued.

The Schick Test.

Mr. BROMFIELD asked the Minister of Health what was the composition of the diphtheria toxin which was used for carrying out the Schick test; and how supplies of it were obtained.—Mr. WHEATLEY replied: The test solution in the Schick test for diphtheria consists of a fresh solution of diphtheria toxin which is bacterium-free and is prepared and diluted so that either 0·1 c.cm. or 0·2 c.cm. (as may be decided) represents one-fiftieth of the minimum lethal dose for a 250 g. guinea-pig. Supplies of diphtheria toxin used for this purpose in this country are obtained from the two or three commercial firms which have made special arrangements for its preparation and sale.

Mr. SUNLIGHT asked the Minister of Health whether his attention had been drawn to the recent serious results of inoculating children with toxin-antitoxin in certain educational establishments in two towns in the United States, damages having been recently awarded for the death of a child through inoculation with toxin-antitoxin; and whether, in view of these and other records of disasters in America through the use of the Schick test and subsequent inoculation with toxin-antitoxin, he would dissociate his department from a system which might cause severe injury and even death to those submitted to it.—Mr. WHEATLEY replied: The answer to the first part of the question is in the affirmative, except that I have no information as to any death resulting from the inoculations referred to. I understand that the reactions following the inoculation of these children were due to their receiving a toxin-antitoxin mixture which had been subjected to extreme cold, this causing a dissociation of the mixture. Now that the unfavourable effect of freezing the mixture has been ascertained, suitable precautions will, of course, be taken in future, and I see no reason to modify the advice given in the reports issued by my department on the use of immunisation methods against diphtheria.

Panel Practitioners.

Mr. TURNER asked the Minister of Health if he would state the number of medical practitioners on the National Health Insurance panel in England and Wales; and what was the average number of panel patients to each medical practitioner on the panel in the West Riding of Yorkshire.—Mr. WHEATLEY replied: The average number of insurance practitioners for England and Wales for the year 1923 was approximately 12,850. The average number of panel patients to each insurance practitioner for the West Riding of Yorkshire was for the same year approximately 1100.

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Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

THE ROYAL SOCIETY, Burlington House, Piccadilly, W.
THURSDAY, April 3rd.—4.30 P.M., *Papers to be read:* Sir Charles Sherrington, P.R.S., and E. G. T. Liddell: Reflexes in Response to Stretch (Myotatic Reflexes). H. M. Carleton and G. C. Robson: The Histology and Function of Certain Sex-limited Characters in the Cuttle Fish *Doratosepion confusa.* (Communicated by Sir Charles Sherrington.) *Paper to be read in Title only:* Dr. J. G. Dusser de Barenne: Experimental Researches on Sensory Localisation in the Cerebral Cortex of the Monkey (Macacus). (Communicated by Sir Charles Sherrington.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 31st.

Social Evening.

Fellows, Members of Sections, Associates, and their friends, will be received by the President, Sir William Hale-White, and Lady Hale-White, at 8.30 P.M.
Sir John Goodwin (late Director-General A.M.S.) will give, at 9 P.M., a brief discourse entitled "Reminiscences."
Music, light refreshments and smoking.

Tuesday, April 1st.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Discussion:
On the Treatment and Functional Results of Tuberculous Disease of the Hip-joint, to be opened by Dr. Gordon Pugh and Mr. T. P. McMurray.
The Discussion will be continued by Mr. Elmslie (President), Sir Henry Gauvain, Mr. Fairbank, Mr. Acton Davis, and others.

Wednesday, April 2nd.

SURGERY: at 5.30 P.M. (Cases at 4.30 P.M.)
Clinical and Pathological Meeting.

Thursday, April 3rd.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.
Specimens:
Prof. Louise McIlroy: An Apparatus for Measuring the New-born Infant.
Short Communications:
Dr. Gilbert Strachan: Combined Carcinoma and Tuberculosis in the Uterus.
Dr. Everard Williams: A Case of Acute Pemphigus in Mother and Child.
Paper:
Dr. Remington Hobbs: The Causes of Acute Infection of the Uterus, including Puerperal Sepsis and Septic Abortion, and their Treatment by Drainage.

Friday, April 4th.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases and Specimens will be shown by Mr. W. M. Mollison, Mr. Jefferson Faulder, Mr. M. Vlasto, Sir James Dundas-Grant, Mr. H. M. Wharry, Mr. F. C. Ormerod, Dr. J. Aldington Gibb, Mr. H. J. Banks-Davis, Mr. J. F. O'Malley, Mr. Norman Patterson, and others.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, April 1st.—5 P.M., Dr. Leonard G. Parsons: Wasting Disorders of Early Infancy. (Last Goulstonian Lecture.)
THURSDAY.—5 P.M., Dr. Thomas McCrae: Clinical Features of Foreign Bodies in the Bronchi. (First Lumleian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.
MONDAY, March 31st, to SATURDAY, April 5th.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine. Tues., 11 A.M., Dr. Thomas Beaton: The Psychoses. Sat., 11 A.M., Dr. Porter Phillips: The Medico-Legal Aspect of Insanity.—LONDON TEMPERANCE HOSPITAL, in conjunction with BETHLEM ROYAL HOSPITAL, NORTH-WESTERN FEVER HOSPITAL, and the ROYAL WESTMINSTER OPHTHALMIC HOSPITAL. Special Intensive Course (first week).—ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: Diagnosis and the Selection of Electrical Treatments.—ROYAL WATERLOO HOSPITAL. Lecture Demonstrations, Ward Work, &c. Mon., 2 P.M., Dr. Woodwark; 3 P.M., Dr. Barron. Tues., 2 P.M., Dr. Myers; 4 P.M., Dr. M. Davidson. Wed., 1.30 P.M., Mr. Cairns Forsyth. Thurs., 1.30 P.M., Dr. R. J. Perkins; 2.30 P.M., Mr. Bickerton; 3.30 P.M., Dr. Myers. Fri., 2 P.M., Dr. R. J. Perkins and Dr. Donaldson; 4 P.M., Mr. Beevor. Sat., 9.30 A.M., Mr. Frankau (Operations). Further particulars can be obtained from the office at 1, Wimpole-street, W.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, March 31st.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Bishop Harman: Eye Department.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Department. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Department. 2.30 P.M., Mr. Armour: Surgical Wards.

THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY, 10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily 10 A.M., to 6 P.M., Saturdays, 10 A.M., to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Prince of Wales's General Hospital).

At 4.30 P.M.

MONDAY, March 31st.—Mr. Aubrey Goodwin: Vaginal Discharge.

TUESDAY, April 1st.—Mr. C. H. Hayton: Treatment of Atrophic Rhinitis with Ozena (with cases).

WEDNESDAY.—Dr. J. Browning Alexander: Bronchiectasis.

FRIDAY.—Dr. C. E. Sundell: Dyspepsia of Infancy.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, April 4th.—4 P.M., Mr. Gill-Carey: Chronic Suppurative Otitis Media.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.

THURSDAY, April 3rd.—4 P.M., Dr. Thompson: Intracranial Tumours.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.

THURSDAY, April 3rd.—5 P.M., Mr. Banister: The Treatment of Contracted Pelvis.

VICTORIA UNIVERSITY OF MANCHESTER MEDICAL SCHOOL.

FRIDAY, April 4th.—5.30 P.M., Dr. G. Northcroft: The Teeth in Relation to Normal and Abnormal Growth.

MANCHESTER CLINICAL SOCIETY.

THURSDAY, April 3rd.—4.30 P.M. (at the University), Dr. Scoueira: Recent Work in Treatment of Disease by Artificial Light.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.

TUESDAY, April 1st.—4.15 P.M., Dr. W. Fletcher Shaw: Leucorrhœa.

Appointments.

FAIRWEATHER, J. W. C., M.B., Ch.B. Edin., has been appointed Medical Officer and Vaccinator for the Parish of Fordoun.

PATTISON, C. LEE, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., Consulting Surgeon to the Tuberculosis Department of the Rotherham Corporation.

Salford Royal Hospital: KNOX, J. F., M.B., Ch.B., B.A.O. Belf., Resident Medical Officer; REID, S. I. H., M.B., Ch.B., B.A.O. Belf., House Physician; TALBOT, G., M.B., Ch.B., B.Sc. Manch., and MCCLURE, C. R., M.R.C.S., L.R.C.P. Lond., House Surgeons; and CRAIG, J. C. B., M.B., Ch.B. Edin., Casualty House Surgeon.

Surgeons under the Factory and Workshop Acts: BRYSON, M., M.B., C.M. Glasg. (Thornhill); SALMON, N. G. H., M.B., B.S. Lond. (Bodmin); BUTLER, T. L., L.R.C.P. Lond., M.R.C.S. (Sherston).

Vacancies.

For further information refer to the advertisement columns.

Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Birmingham Union, Selly Oak Hospital.—Res. Asst. M.O. £300.
British Guiana Diamond Fields.—Government M.O. £500.
Cancer Hospital, Fulham-road, S.W.—H.S. £100.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Radiographer.
Charing Cross Hospital, W.C.—Med. Reg. and Surg. Reg. Each £150. Also Asst. Surg.
Derbyshire Royal Infirmary, Derby.—H.S., &c. Also Asst. H.S., &c. Each £200.
Dublin University, Trinity College.—Prof. of Pathology. £800.
Evelina Hospital for Children, Southwark, S.E.—H.S. and H.P. Each £160.
Hospital for Consumption and Diseases of the Chest, S.W.—H.P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. £50.
Hull City Asylum.—Med. Supt. £1000.
Keighley, Victoria Hospital.—H.S. £180.
Kensington, Fulham, and Chelsea Hospital, Richmond-road, Earl's Court, S.W.—Sen. and Jun. Res. M.O.'s. £100 and £75 respectively.
King's College Hospital, Denmark Hill, S.E.—Jun. P.
Lambeth Parish Hospital.—Jun. A.M.O. £200.
Leeds City.—Chief Clin. Tub. O. £900.
London Jewish Hospital, Stepney Green, E.—Cas. O. £200.
London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. and Med. Reg. Each 40 guineas.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. £125.
Manchester, Baguley Sanatorium.—Third Asst. M.O. £100.
Metropolitan Hospital, Kingsland-road, E.—Sen. H.P., H.S., Jun. H.P., H.S., and Two Cas. O.'s. Each £100. Hon. Anæsthetist.
Norfolk County Council.—Asst. Tub. O. £600.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. S.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.
Poplar Metropolitan Borough.—Asst. Tub. O. £600.
Prince of Wales's General Hospital, Tottenham, N.—H.S., H.P. Each £150. Jun. H.S. and Jun. H.P. Each £110.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—R.M.O. £200.
Rangoon Corporation.—Health Officer. Rs.1200 per month.
St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.—Clin. Assts.
Sheffield Royal Hospital.—Asst. Cas. O. £100.
Somerset Mental Hospital, Wells.—Asst. M.O. £300.
Stafford, Coton Hill Mental Hospital.—Med. Supt. £600.
Surrey County Council.—Asst. M.O.H. £600.
Tunbridge Wells General Hospital.—H.S. £160.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg.
Western Australia, Medical and Health Dept.—Bacteriologist and Pathologist. £708.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Milborne Port, Somerset; Northwich, Cheshire; Dronfield, Derbyshire.

Births, Marriages, and Deaths.

BIRTHS.

CLARKE.—On March 19th, at Victoria-square, Clifton, Bristol, the wife of Dr. Richard C. Clarke, of twin daughters.

ELLISON.—On March 25th, at 36, Devonshire-place, W.1, to Dorothy, wife of John Ellison, a daughter.

HODGSON.—On March 16th, at Andover, the wife of Dr R. G. K. Hodgson, of a son.

OSBORN.—On March 17th, at Sheet-street, Windsor, the wife of Dr. A. G. Osborn, of a daughter.

MARRIAGES.

MORRISON—MARSDEN.—On March 25th, at Sefton Park Presbyterian Church, Liverpool, by the Rev. George H. Morrison, D.D., of Wellington Church, Glasgow, father of the bridegroom, assisted by the Rev. J. Somerled Macdonald, M.A., George Herbert Morrison, M.B., Ch.B., to Helen Mary (May), elder daughter of Mr. and Mrs. J. Wilberforce Marsden, 26, Croxteth-road, Liverpool, and grand-daughter of the late Rev. Henry Marder Douglas, of Kirkcaldy.

DEATHS.

MACEWEN.—On March 22nd, at Woodside-crescent, Glasgow, Sir William Macewen.

REID.—On March 22nd, at St. Augustine's-mansions, S.W., Douglas Arthur Reid, M.D., J.P., in his ninety-first year, assistant surgeon 90th Light Infantry during Crimean War.

RUNDLE.—On March 19th, at Clarence-parade, Southsea, Henry Rundle, F.R.C.S., aged 79.

SYDENHAM.—On March 18th, George Francis Sydenham, F.R.C.S., J.P., of Dulverton, Somerset, aged 63 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CYTOCLESIS.*

A PHENOMENON EXPLAINING THE COURSE OF EMBRYONAL DEVELOPMENT.

BY F. WOOD JONES, D.SC. LOND., M.R.C.S. ENG.,
PROFESSOR OF ANATOMY, UNIVERSITY OF ADELAIDE.

IT was in 1913, at the International Congress of Medicine held in London, that Ariens Kappers, of Amsterdam, first succeeded in making the bulk of British anatomists appreciate his conception of "neurobiotaxis." That an animal reacts to a sensory stimulus by an appropriate motor response is a phenomenon familiar to everyone. That a newborn animal will do this is common knowledge. Directly the nipple of the mother is near to the newborn pup's nose the sightless senseless creature grasps it with its lips, and the whole complex mechanism of suckling is initiated. The contrivance by which the sensory stimulus of the contact with the nipple produces the appropriate motor response of the movements of the lips and tongue in suckling is laid down in the central nervous system of the pup long before it is born.

The underlying principle of this contrivance was first defined by Ariens Kappers. Suppose that sensory impulses are streaming in, or will one day stream in, from some sense organ to a sensory nerve centre in the brain; in order to fulfil the whole rôle of life, sensation must be acted on and movement must be produced. The sensory nerve centres must, therefore, be related not only in some way to motor nerve centres, but to the *appropriate* motor nerve centres; the embryological bases of the mechanisms of the future in-streaming sensory impulses always "call" to their nerve centres the motor nerve centres which are so linked up with the motor nerves and muscles as to produce the most appropriate reflex response. In the developing brain these things are called together; the living, developing, sensory nerve cells call the living motor nerve cells and hold them by some strange force, remaining in apposition whilst all else around them changes.

Here is something more subtle even than a hormone: a call of cell to cell, a hold of cell on cell; a call exerted long before function demands the harmonious outcome of the call; a call of predestiny; a call of ancestral memory—it matters not what it is termed. In the arrangement of the embryonic sensory and motor ganglia in the brain stem we are dealing with well ascertained facts; no work previous to that of Ariens Kappers and Davidson Black afforded any sort of solution to the problem of the varied arrangement of these ganglia in the different types of animals. Neurobiotaxis is a term applied to the peculiar "call" evinced among the myriad cells which constitute the central nervous system; but the call is not limited to the central nervous system. There is a general phenomenon of cell call, a wonderful influence which living cells exert, and this strange force I shall here name cytoclesis, for which term I am indebted to Prof. Darnley Naylor.

Cytoclesis in the Development of the Eye.

Some of the most beautiful manifestations of cytoclesis are unfolded in the relation of the nervous system to other systems and organs in the body. Take, for example, the eye and its appendages. As the rudiment of the developing eye grows towards the skin there come into being, at the site of its coming, the rudiments of the superficial parts of the organ of vision. From first to last the story of the developing eye moves in a fairyland of insoluble mysteries. First tucked away (and, one would hazard, folded in by an ill-chance) within the dark neural tube, the eye struggles to regain the surface of the head, which one day will be exposed to the rays of light. After its probation period as part of the infolded neural tube, after its painful struggles to be free and to grow towards the surface, where in the distant future it will meet those rays which alone can set its cells vibrating, it still has its trump card to play: it still has its call. Something called it to the surface, and as it approaches the surface its own call goes forth, and the cells of the embryonic skin of the surface of the face respond to the call. The optic cup, growing outwards from the brain, will form the light-sensitive parts of the eye hidden in the layers of the retina; but these parts were useless if the optic cup remains covered by the ordinary opaque skin. It therefore calls to the ectoderm cells of the area towards which it is growing, and a transparent lens and cornea are called into being from cells which elsewhere form the ordinary opaque skin. That the changes which result in the formation of the lens are due to cytoclesis exerted by the optic cup seems beyond question. Should the optic cup fail to develop, or should it fail to grow towards the surface, then the call does not reach the ectoderm of that portion of the face where the transparent media of the eye should be developed, and lens formation does not take place. Moreover, the astonishing work of Lewis (1904) and Sphemann (1912) has shown that if the developing optic cup of a tadpole be removed from its original site and transplanted beneath the embryonic skin of some other part of the body it can still exert its cytoclesis and produce a lens in an altogether abnormal situation. The call is lodged in the cells of the optic cup, and this call may be responded to by the skin of the abdomen if the optic cup be transplanted there. That the embryonic skin of the abdomen should be able to form a lens for a transplanted portion of an eye is a marvel, and only one force, the cytoclesis of the optic cup, can produce the marvel.

Cytoclesis in the Development of the Alimentary System.

Ignoring a host of other instances in which cytoclesis is dramatically displayed in the developing nervous system and its accompanying sense organs, it is well to pass to other systems of the body to see new manifestations of the process. In the developing alimentary system the influence of cytoclesis is seen everywhere. The relation of the stomodeum and the foregut, the call of the liver cells to the vitelline blood, manifest the same phenomenon. But for a grand display we may turn to the developing hind gut and the skin of the perineal region. When the hollow tube, derived from the hypoderm, which constitutes the hind gut or large intestine, grows backwards towards the hind end of the body it exerts its call upon the ectodermal skin of the hind end, and the ectodermal cells start to grow inwards to meet the advancing tube. A skin dimple is thus produced; a skin ingrowth is formed to meet the intestinal downgrowth, a rectum approaches a preformed anus. As the rectum approaches the anal dimple deepens; they are guided towards each other so that they come in contact and only a septum separates them. The septum breaks down, and the alimentary tube opens by an orifice on the surface of the skin. The hypoderm cells of the hind gut have exerted their cytoclesis upon the ectoderm cells of the perineum. But if the rectal downgrowth fails to develop in a normal manner, if that portion which I have termed the "post-allantoic gut" is not perfected, then no call is felt by the ectoderm of the hind end, and the anal dimple fails to develop. Here we almost seem to have a space limit for the action of cytoclesis. A complete failure of the development of the post-allantoic gut results in a complete absence of the call to the ectoderm, and no anal ingrowth is formed. In this way there results the condition of imperforate rectum. But any degree of development of the post-allantoic gut exerts its cytoclesis, feeble or powerful, and some formation of an anal ingrowth takes place. In this way there result the varying degrees of imperforate anus. The cytoclesis of the hypodermic hind gut appears to be exerted on the ectodermic cells of the perineal region only when the hind gut has developed so far as to form a "post-allantoic" portion.

Cytoclesis in the Renal Excretory Apparatus.

I turn now to the manifestation of the cell call in the formation of the renal excretory apparatus. The myriad secreting tubules of the kidney are formed in the hind portion of the great secreting primordium known as the Wolffian body. The myriad minute collecting ducts are formed from an altogether different embryological basis, for they are budded out from the main kidney duct or ureter. Nevertheless, although these two entities are involved in the completion of all the kidney tubules, there is the marvel that results in each secretory tubule in the metanephric portion of the Wolffian body meeting a collecting tubule from the ureter accurately end to end. From the glomerulus, where urine is separated from blood, to the ureter, by which urine is conveyed to the bladder, there is a complete duct; a myriad of such complete ducts. But each duct is composed of two sections, preformed from different embryological elements, but guided to meet each other by a call; each kidney tubule meets each ureteric tubule end to end, and so completes the canal. Here is wholesale cytoclesis: thousands of tubules in each kidney meeting end to end, as the cut ends of thread in two tangled skeins might find each other and join. Again, cytoclesis may fail, and then the myriad secreting tubules of the kidney fail to open into the myriad collecting tubules of the ureter. In this condition the secretory metanephric tubules, having no outlet, dilate with their own secretion into the curious pathological manifestation known as congenital cystic kidney. Congenital cystic kidney is an evidence of the failure of the cytoclesis of the metanephric tubules.

There is no need to multiply instances. Of a certainty cytoclesis is everywhere displayed in the tissues of the animal

* An abstract of part of the commemoration address on "The Position of Anatomy in the Modern Medical Curriculum," delivered in 1923 at the University of Adelaide.

body. Surely it is not too imaginative a thesis to maintain that this ordered call of cell to cell, this prompting as to station, is in reality *the* force which determines that a definite ordered system of organs is created out of a cellular mass. The whole completed perfection of the animal body is in itself evidence of the action of cytoclesis. We are the products of cytoclesis. A community of cells in some way conducts its own destiny, so that by the cytocletic word of command some cells take their station here and some there. An embryo may be said to be a cell community governed and directed by cytoclesis. It is remarkable that long before the microscope was introduced into anatomical studies, and still longer before the cellular nature of tissues was demonstrated, the conception of the animal body as a microcosmos was in general acceptance. In 1651, when Helkiah Crooke wrote his highly instructive work on human anatomy, he entitled it "Microcosmographia: a Description of the Body of Man." So much modern work has progressed upon purely physical or chemical lines of research that we are, maybe, in some danger of regarding the body as a test tube in which chemical reactions occur, or as a thing of which the whole ordered building is a mere matter of simple physical laws.

There are, indeed, some signs and portents that certain of the more subtle chemical explanations of vital phenomena need further examination. The recent work of Cramer seems to indicate that the most elusive of chemical agencies, that of the vitamins, resolves itself into the familiar story of structure and function, rather than one of undefinable chemical action. Deprivation of a vitamin appears to damage a cell complex, and owing to the damage of a series of cells the whole tissues suffer. The ailing of the body in consequence of the damage of a tissue or cell community is a concept different from that of a body suffering from the deprivation of an obscure chemical factor, but altogether in harmony with the picture of the cellular microcosmos ordered by cytocletic action.

Processes of Formation and Repair: A Comparison.

In many ways the formation of parts in the developing embryo is singularly like the process which accompanies the repair of damage inflicted in adult life. The further we go back along the animal scale the more alike the processes become. The power of repair of the human body is limited; we cannot vie with those animals which can renew a limb after its complete loss; nevertheless, the wonders of the possibility of repair in human tissues are manifold. For instance, no surgeon can so accurately oppose the two cut ends of a divided nerve that each regenerating fibre may be opposite its dead and degenerating continuation: and, indeed, one end of the divided nerve may be given a half turn and united thus, and still, when healing is complete, function will be restored. Now, in an ordinary mixed nerve there are sensory fibres and motor fibres, each having its proper connexion in the spinal cord, each having its proper terminal in skin or muscle. It is marvel enough that the down-growing fibres should even find the tubular sheaths of the degenerated portion; it is marvel beyond comprehension that the motor fibres, growing from cells in the anterior horn of the spinal cord, should follow the old sheathing that leads to end-organs in muscles, while the sensory fibres, growing from cells in the posterior root ganglia, find that which leads to the end-organs in the skin. Cytoclesis guides the regenerating fibre along the proper pathway that leads to its appropriate end-organ. And in the repair of bone, or the alteration of bone structure with the development of new strains and stresses, in the processes of healing as displayed in any tissue, everywhere in the details of repair the hand of cytoclesis is to be seen. If cytoclesis be the process which leads to the ordered formation of parts and organs, it surely is the process which leads to their ordered reformation after injury.

If there is a fault to be found with modern medicine, and especially with modern surgery, it might be urged that sufficient regard is not always paid to the wonderful powers of the vis medicatrix naturæ. The more conquests we have, the more successful we become in treating bodily ills, the less we are inclined to ascribe to the vis medicatrix naturæ the cure of our "cases." There is a desire often manifested by the surgeon, and to a lesser degree by the physician, to cure the patient, rather than to put him in the way of deriving the benefit of the cytocletic action of repair. It is a mercy that modern medicine, which has jurisdiction over our methods of repair, has no jurisdiction over our methods of formation. Few surgeons would care to permit the kidney to develop in its extremely risky manner; of a surety they would do an operation to ensure an end-to-end junction of the tubules.

Cytoclesis and Malignancy.

Cytoclesis, we may believe, is the factor of ordered formation and ordered reformation. But perhaps it has another and a more sinister rôle. In many processes of normal embryonic growth there is presented a picture of what may be termed the invasion of one tissue by another. Cytoclesis appears to be able to call from tissue to tissue, so that the cells of one tissue invade an intervening tissue in order to reach their goal. The curious cells of the embryonic trophoblast have one call, one function; through the maternal uterine tissue they seek the blood-vessels from which the embryonic nourishment may be obtained. In the cells of the trophoblast cytoclesis may be said to manifest itself as a blood quest; a blood quest which causes these cells to invade the uterine mucosa in a manner which, without being fanciful, we may describe as hostile. There is something strange in the behaviour of these syncytial cells, something even in their normal behaviour which suggests that type of tissue hostility which we term malignancy. The blood quest of the trophoblast is normally hostile in the maternal tissues: abnormally we know too well it may become in fact malignant, malignant with the terrible malignancy of deciduoma malignum. Again, the growth of the liver cells towards the vitelline blood has much in it to suggest a cytocletic hostility, a call which is answered regardless of intervening tissues. Is it possible that, in the adult, a perversion of cytoclesis or an untimely reawakening of cytoclesis produces the phenomenon of malignancy? Such a conception would seem to fit in with most of the known facts. Give the anatomist cytoclesis and he holds the key of admittance to hospital wards, operating theatre, and clinics. In all these spheres he has a rightful place, and if modern medicine and modern surgery do not admit him to their councils the loss is theirs, or rather that of their patients.

SMOULDERING CLOTHES.

To the Editor of THE LANCET.

SIR,—I had this week the misfortune to be present at a grave burning accident to a girl of 12 years and was greatly impressed by three things: (1) that although flame is easily extinguished by coats and rugs, smouldering is very difficult to extinguish, especially in the less accessible regions; (2) that clothing even under the best circumstances cannot be removed with desirable speed; (3) and last of all, with the great difficulty I had in persuading the bystanders to bring me water for extinguishing purposes. I found the cause for this later in two popular text-books of first-aid where the use of water in extinguishing burning clothing is not mentioned, I presume, because of the mess caused by the carbonised material when wet. Could any of your readers enlighten me as to the reason for this? A horrifying amount of avoidable suffering could be prevented if this superstition were eradicated. I cannot understand what harm can be done by lukewarm water.—I am, Sir, yours faithfully,

March 17th, 1924. "HUMANITY."

ABDOMINAL CONTROL.

A FIRST-CLASS athlete, who, as years advanced, began to run to fat, has written a little book[1] to tell us how he reduced his own weight, and how he does the same for others. Part I. consists of 11 short chapters. The author states his own story, and gives a brief epitome of Sir Arbuthnot Lane's condemnation of the faulty colon. He deals with posture and its value, and with enteroptosis and its disadvantages. In the chapter devoted to flat feet, he says truly enough: "The grace of movement is destroyed, while headache, backache, and general weariness help to complete the misery of the subject." The value of exercise after operation and confinement is well set out. He points out the danger of the muscular wall of the abdomen losing "tone" permanently, and, with true optimism, adds that the "early and judicious employment [of massage] after operation is now a recognised measure all over the civilised world." He says of the time-honoured binder used in post-maternity work, and with much truth: "It certainly gives .... a feeling of comfort .... but, so far as helping to restore the muscles to their normal state, the binder might as well have been tied round the bedstead." The author's views on golf as exercise are interesting. The two chapters on abdominal control are plain common-sense; and when speaking of diet, importance of the fluid intake is emphasised. The chapter which deals with faults of the usual systems of exercise is severe. Doubtless they are true if the "system" is picked up casually or is improperly taught, but the general condemnation is rather too sweeping.

Part II. consists of a description of eight exercises which should be used by the obese for the reduction of weight. These are to some extent familiar. For example, the heels-raising-knee-bending exercise. Others are newer and should be of service. The descriptions are good, and photographs, with the exception of No. 6, the indications of which are not very clear, make it easy to follow the meaning of the text. The book is worthy of attention, and the application of the principles set out ought to meet with success.

[1] The Culture of the Abdomen. By F. A. Hornibrook. London: William Heinemann. 1924. Pp. 67. Illustrated. 6s.

MEDICAL RECIPROCITY IN UKRAINE.

To the Editor of THE LANCET.

SIR,—May I ask the hospitality of your columns to invite British medical men who know the Ukrainian language and are interested in the progress of medical and surgical science in the Ukraine to communicate with the Ukrainian Red Cross Society, 150, Southampton-row, London, W.C. 1. It is desired to offer medical journals and other papers for exchange and in other ways to endeavour to maintain contact between the medical faculties of the two countries. Ukrainian doctors would be glad to learn of their British colleagues and may have something of interest to offer in return. I am, Sir, yours faithfully,

March 21st, 1924. ALEXANDRA RACOVSKI.

"AMBIDEX" NAIL BRUSHES.

THESE are cheap but efficient bristle brushes, stiff enough to cleanse the nails yet sufficiently soft to be used with comfort for the hands. In order to avoid the use of the finest bristle, which is expensive, the Barnett Brush Manufacturing Co., Ltd., Sandringham Works, Enfield Highway, Middlesex, employ a special method of cutting bristles with a very satisfactory result. The backs of the brushes are so constructed that a firm grip by the fingers can be maintained, while the hollow shape of the face of the brush makes it possible to reach all parts of the hand. At the same time the brush wears evenly and does not go flat in the middle. The prices vary from 1*s.* 6*d.* to 7*s.* 6*d.*, according to the quality of the bristles used and the size of the brush.

AMBULANCE CAMELS.

OVER a century ago the camel was employed by European armies in the East for the transport of casualties, but since then the rôle of that patient beast of burden in military medical history has been somewhat intermittent. Writing in a recent issue of the *Journal of the Royal Army Corps*, Capt. E. B. Marsh records that Napoleon used camels in Egypt for carrying the sick and wounded, who were slung in pairs, one on each side of the camel, in litters devised by Baron Larrey. He reminds us, too, that Surgeon-Major F. H. Brett, surgeon to the Governor-General's bodyguard, recommended, in 1839, such camel transport as "the most comfortable and safe mode of invalid travelling that I have ever heard or read of." But a thoroughly satisfactory litter or "Kajawah" had not been found, so ambulance camels ceased to be employed. There were a few still in Afghanistan in 1879, but in the Malakand in 1897 and in 1905 no mention is made of them. The late war, however, saw camels again mobilised in Egypt, in Mesopotamia, and in East Africa, but they came into their own in Waziristan in 1919–20, when some 90 per cent. of the wounded were thus evacuated. The camel's large, padded feet made it particularly suitable for work in the stony ravines and fords of that area. While it took eight orderlies to carry a man on a stretcher, one orderly could look after four patients on two camels. The kneeling and rising of a camel gives a nasty jerk to his burden, but at large stations, like Jandola, embarking and disembarking platforms were built. One camel will carry from 400 to 600 lb., but he will only march 2½ miles an hour.

A BIBLIOGRAPHY OF EUGENICS.

THE information we possess on the biological evolution of man is so widely scattered that a Bibliography of Eugenics[1] will be welcomed. The net has been cast wide, perhaps too wide, and a good deal of rubbish is sandwiched between contributions of recognised value. Prof. Holmes acknowledges that the literature on this vast subject is very much at loose ends; much of it is uncritical; and comparatively little of it is written with the competence of the highly trained specialist.

The sections into which the mass of inchoate material is divided are as follows: Heredity and Evolution; Eugenics and Works of a General Character; Genealogy; The Problem of Degeneracy; Alleged Increase of Insanity; Notorious Families; The Heredity of Human Traits; Heredity of Human Defect (Inheritance of Feeble-Mindedness, Inheritance of Epilepsy, Inheritance of Insanity, Inheritance of Deafness, the Hereditary Factor in Tuberculosis); Alcohol in Relation to Heredity; Lead Poisoning; Blastophthoria; Racial Influence of Venereal Disease; The Hereditary Factor in Crime; The Hereditary Factor in Delinquency, Prostitution, Pauperism, and Vagrancy (Delinquency, Prostitution, Pauperism and Vagrancy); The Inheritance of Mental Ability; The Alleged Relation of Genius to Insanity and Other Abnormalities; Race; The Birth-rate; Neo-Malthusianism—Birth Control; Natural Selection in Man; Selective Effect of Infant Mortality; Selective Influence of War; Sexual Selection in Man; Urban Selection and the Influence of Industrial Development on Racial Heredity; The Racial Influence of Religion; Immigration and Emigration as Related to Racial Changes; Consanguinity; Race Mixture and the Intermarriage of Different Stocks; Determination of Sex; The Sex Ratio; The Influence of Age of Parents on Offspring; The Influence of Order of Birth on Offspring; Negative Eugenics, Sterilisation, Segregation. These are set out in full in order that those interested in one or other of the subjects listed may realise that this bibliography is comprehensive and is likely to supply the needs of workers in widely separated fields.

[1] By Prof. S. J. Holmes, Professor of Zoology in the University of California. University of California Press. 1924.

THOUGHT-READING MADE EASY.

THE current number of the *Skandinav. Arch. f. Physiologie* (1924, xlv., 74) contains a paper by Jarl Kohler and Curt Roos on an interesting psycho-physiological phenomenon which, as the authors suggest, is being used by professional thought-readers in their performances. As the result of attending such a thought-reading séance in which the thought-reader had to guess a page in a book which a member of the audience—whom we will call the medium—had selected and of which he was thinking, the authors suspected that a slight involuntary change in the respiratory movements betrayed the thoughts of the medium. They therefore carried out the following experiment. A Marey tambour was fixed to a person so that the respiratory movements could be registered on a drum behind a screen. The person, who was not aware of the object of the tambour, was then asked to think of a figure between 1 and 100 and to concentrate his mind on it. The "thought-reader" then began to count slowly aloud beginning with 1. As soon as he reached the figure of which the "medium" was thinking the "medium" made a number of deep inspirations, which are clearly shown in the records accompanying the paper. Of 12 persons who served as a medium only one was a failure. One made such a deep inspiration when the number was reached that the membrane covering the tambour burst.

THE HEALING ART AMONG THE ANCIENTS.

THAT the practice of medicine and surgery reached a relatively high state of development in ancient Egypt we have abundant proof, both in the records left by the Egyptians themselves and in the references made to Egyptian skill in healing by the later Greek and Roman historians and poets. When the Greeks penetrated to Egypt in the seventh century B.C., Egyptian medicine had probably passed its zenith which some archæologists date as early as 2000 B.C. The history of ancient Egyptian surgery forms the subject of an interesting article by Mr. H. B. Roderick in the Lent number of the *Cambridge University Medical Society Magazine*, where the author gives several quotations from the well-known "Ebers Papyrus," the most ancient complete book in existence, which is held to belong to the fifteenth century B.C., and from which most of our knowledge of ancient medical lore is derived. The papyrus begins with a number of incantations against disease and then proceeds to enumerate a large number of diseases in detail with about 700 different remedies for the same. Thus a favourite Egyptian pomade for baldness consisted of equal parts of the fat of the lion, hippopotamus, crocodile, goose, serpent, and ibex. Another consisted of equal parts of writing ink and cerebro-spinal fluid. A large proportion of the diseases known to modern medical science are carefully classified and their symptoms minutely described. Here we find some approach to the accurate clinical pictures of Hippocrates, and many have supposed on this slender evidence that the Father of Medicine was indebted to Egypt for much of his knowledge. Mr. Roderick does not hold this view, for Greek medicine and particularly surgery even at the time of the Trojan War, was entirely free from priestly domination, whereas later Egyptian medicine was certainly in the hands of the priests. As it is known that the Egyptians practised embalming from about 2500 B.C., it can be inferred that this process necessitated some knowledge of anatomy, and although this was rudimentary in character, records show that the Egyptians reached a degree of knowledge and skill in surgery well in advance of that reached by any of their contemporaries. Their teaching was, however, essentially non-progressive in character, and this characteristic is also seen in the Assyrian medical texts, so faithfully compiled[1] by Mr. R. Campbell Thompson, found in the royal library of Ashurbanipal which belong to a much later date. At the time of Galen Egyptian medical writings had fallen into disrepute, but it can be said that Egypt at least exercised a powerful influence through the channels of Judah and Greece on the development of mankind.

[1] THE LANCET, March 22nd, 1924, p. 601.